SERVICE MANUAL

SERIES 360 EP
SERIES 360 ES

Order no.

350-8135	Index -	Service manual cpl.	Service-Anleitung kpl.
350-7906	Index -	Content	Inhalt

Technische Änderungen vorbehalten

Subject to technical modification

Copyright

These service instructions are protected by copyright. All rights reserved. No part of the service instructions may be reproduced, processed, duplicated or published in any form by photocopying, microfilming, reprinting or other process, in particular electronic means, without the written agreement of Precisa Gravimetrics AG.

Diese Service-Anleitung ist urheberrechtlich geschützt. Alle Rechte vorbehalten. Kein Teil der Serviceanleitung darf ohne schriftliche Genehmigung der Precisa Gravimetrics AG in irgendeiner Form durch Fotokopien, Mikrofilm, Nachdruck oder andere Verfahren, insbesondere auch elektronischer Art, reproduziert, verarbeitet, vervielfältigt oder verbreitet werden.

© Precisa Gravimetrics AG, 8953 Dietikon, Switzerland, 2009.

Contents / Inhaltsverzeichnis

SERVICE MANUAL

SERIES 360 EP
SERIES 360 ES

Section A: Mechanics / Kapitel A: Mechanik - - - - - - - - A1

1. How to order spare parts / Anleitung zur Bestellung von Ersatzteilen A2
2. Bottom of balance / Gehäuse Unterteil A4
2.1 Measuring resistor A2 / Messwiderstand A2 ..... A5
2.2 Measuring resistor A3 / Messwiderstand A3 ..... A5
2.3 Measuring resistor M, C, D / Messwiderstand M, C, D A5
3. Top of balance / Gehäuse Oberteil A6
3.1 Labels Series 360 EP A7
3.2 Labels Series 360 ES A7
4. Weighing cell / Wägezelle A8
4.1 Group A2 / Gruppe A2 ..... A9
4.2 Group A3 / Gruppe A3 ..... A10
4.3 Group M1 / Gruppe M1 ..... A11
4.4 Group M2 / Gruppe M2 ..... A12
4.5 Group C2 / Gruppe C2 ..... A13
4.6 Group C3 / Gruppe C3 ..... A14
4.7 Group D1 / Gruppe D1 ..... A15
4.8 Group D2 / Gruppe D2 ..... A16
4.9 Overview of flexure sheet repair set / Übersicht der Reparatur-Lagersets A17
4.10 Overview of flexure sheets / Übersicht der Biegelager A18
5. Weighing pan Group A / Waagschale Gruppe A A19
6. Weighing pan 135 Group M / Waagschale 135 Gruppe M A20
6.1 Group / Gruppe M1 ..... A21
6.2 Group / Gruppe M2 ..... A21
7. Weighing pan 200 Group C,D / Waagschale 200 Gruppe C,D A22
8. Windshield EP / Windschutz EP 350-8657 ..... A23
9. Windshield ES / Windschutz ES 350-8659 ..... A25
10. Windshield XT / Windschutz XT 350-8517 ..... A27
11. Windshield standard M / Windschutz standard M A29
12. Calibration weights for 320-7140 / Kalibriergewichte für 320-7140 ..... A30
12.1 Group / Gruppe A2,A3 ..... A30
12.2 Group / Gruppe M1 ..... A30
12.3 Group / Gruppe M2,C2,C3,D1,D2 ..... A30
13. Power supply / Netzadapter A31

Section B: Electronics / Kapitel B: Elektronik - - - - - - - B1

1. Main board / Hauptprint 360-7200-020 ..... B2
1.1 Exchange of the main board 360-7200-020 ..... B2
1.2 Austauschen des Hauptprintes 360-7200-020 ..... B2
2. Connector board / Steckerprint 360-7201-010 ..... B3
2.1 Assembly / Bestückung 360-7201-010 ..... B3

Section C: Service - C1

1. Service tools and equipment C2
1.1 Tool set (350-8537) C2
1.2 Equipment C3
2. Opening up a balance C4
2.1 General procedure for opening up a Series 360 series balance C4
3. Introduction / Preparation of the tools C5
3.1 Introduction C5
3.2 Preparation of the tools C5
4. Dismantling the weighing cell C6
4.1 Removing the top of balance C6
4.2 Removing the weighing cell from the bottom of balance C6
4.3 Removing the flexure-strap C7
4.4 Removing the two flexure holders C7
4.5 Removing the coil C7
4.6 Removing the support piece C7
4.7 Removing the balance arm C7
5. Installing the new „H-flexure sheets“ C9
5.1 Removing the old „H-flexure sheets“ C9
5.2 Installing the new „H-flexure sheets“ C9
6. Cleaning C10
6.1 Cleaning the pot C10
6.2 Cleaning the coil C10
6.3 Final check of cleaning C10
7. Assembling the weighing cell C11
7.1 Assembling the balance arm C11
7.2 Assembling the coil, the magnet cover and the transport safety device C11
7.3 Assembling the sensor mechanism and the stopper C12
7.4 Assembling new “V-flexure sheets“ C12
7.5 Assembling the support piece and inner cone C13
7.6 Assembling the flexure holders C13
7.7 Assembling the new „flexure-strap“ C14
7.8 Dismantling the assembly jigs C15
7.9 Installing the weighing cell in the bottom of balance C15

Section D: Adjustments - D1

1. Adjustments D2
1.1 Activation of the service mode ES and EP D2
1.2 Set the open balance to the service mode ES or EP D2

1.3 Adjusting of the symmetry ES and EP D3
1.4 Checking the pre-load ES and EP D3
1.5 Checking the lowering process of the calibration weight ES D3
1.6 Checking the lowering process of the calibration weight EP D4
1.7 Adjusting the corner load D4
1.8 Final check of corner load D6
1.9 Set the closed balance to the service mode ES or EP D6
1.10 Linearisation of the balance D7
1.11 Adjustment of the internal calibration weight D7
1.12 Final check of the adjustment D7
1.13 S-correction of a balance D8

2. Final check H9

3. Error messages H10

3.1 Operating error H10
3.2 Fatal error H10
3.3 Hardware error H11

4. Discussion with the manufacturer H12

Section A: Mechanics / Kapitel A: Mechanik

1. How to order spare parts / Anleitung zur Bestellung von Ersatzteilen

In order to faciliate the searching of spare parts, this chapter is reorganized in groups.
The following chart shows, to which group the balance belongs, regarding the series number, the order number and the model type.

Example:
Series 360EP
Order No. 360-9235
Model 420A-FR
Group A3

On all subordinated representations, the desired spare part is to find in group **A3**

Um die Suche nach dem gewünschten Ersatzteil zu erleichtern, wurde dieses Kapitel in Gruppen zusammengefasst.Die nachfolgende Tabelle zeigt auf, zu welcher Gruppe die Waage anhand der Serie-, der Bestellnummer und des Modelles zuzuordnen ist.

Beispiel :
Serie 360EP
Bestell-Nr. 360-9235
Modell 420A-FR
Gruppe A3

In allen folgenden Darstellungen ist das gewünschte Ersatzteil unter der Gruppe **A3** zu finden

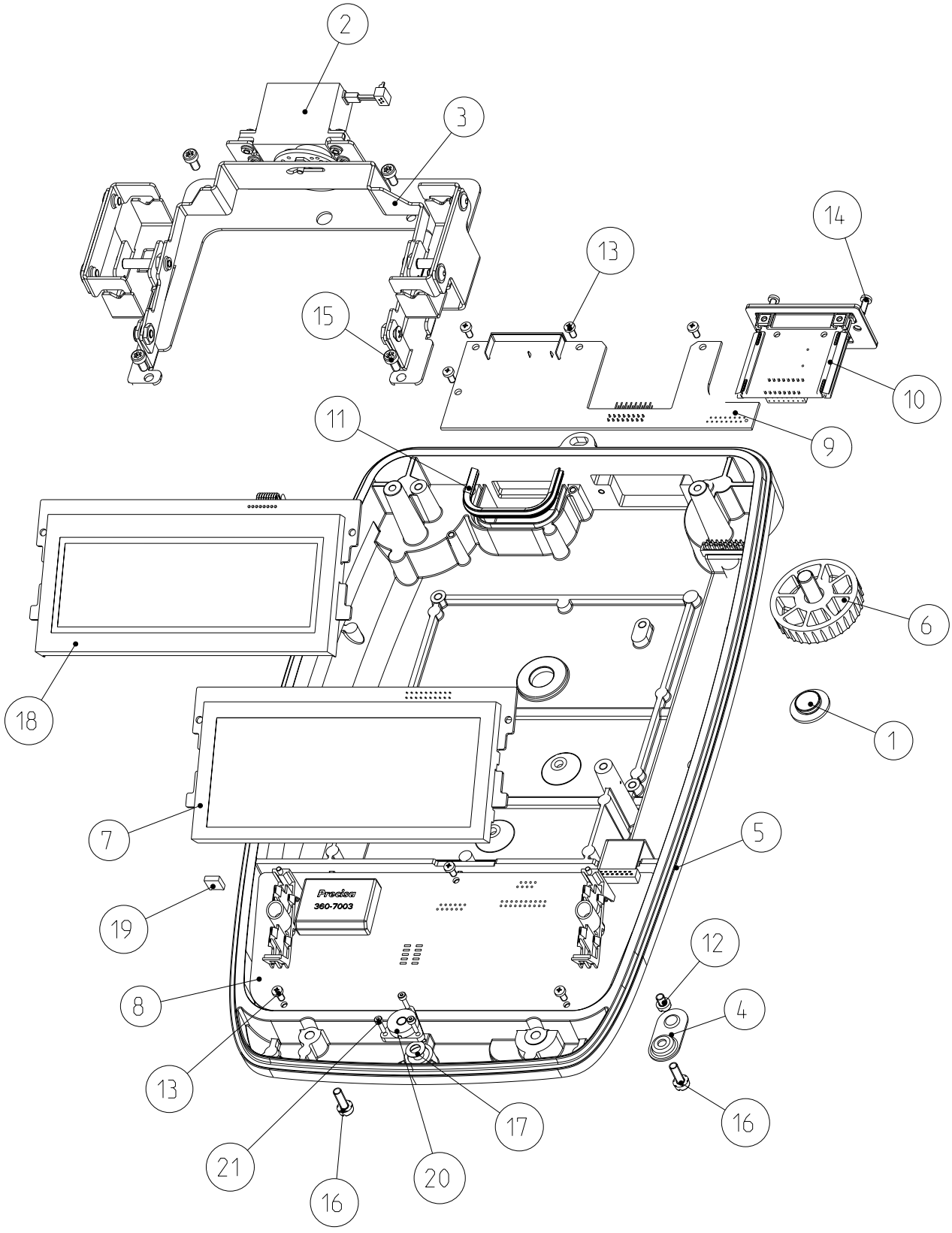
Series 360 EP

Order-No.	Model	Group
360-9100	125SM	A2
360-9101	225SM-DR	A2
360-9231	120A	A2
360-9232	220A	A2
360-9233	320A	A3
360-9234	420A	A3
360-9235	420A-FR	A3
360-9236	620A-DR	A3
360-9345	320M	M1
360-9346	620M	M1
360-9347	920M	M2
360-9348	1220M	M2
360-9349	620M-FR	M1
360-9350	1220M-FR	M2
360-9351	3220M-DR	M2
360-9437	1200C	C2
360-9438	2200C	C2
360-9439	4200C	C3
360-9440	6200C	C3
360-9441	8200C	C3
360-9442	6200C-FR	C3
360-9443	8200C-DR	C3
360-9534	6200D	D1
360-9535	8200D	D2
360-9536	12200D	D2
360-9613	12200G	D2

Series 360 ES

Order-No.	Model	Group
360-9102	125SM	A2
360-9103	225SM-DR	A2
360-9237	120A	A2
360-9238	220A	A2
360-9239	320A	A3
360-9240	420A	A3
360-9241	420A-FR	A3
360-9242	620A-DR	A3
360-9352	320M	M1
360-9353	620M	M1
360-9354	920M	M2
360-9355	1220M	M2
360-9356	620M-FR	M1
360-9357	1220M-FR	M2
360-9358	3220M-DR	M2
360-9444	1200C	C2
360-9445	2200C	C2
360-9446	4200C	C3
360-9447	6200C	C3
360-9448	8200C	C3
360-9449	6200C-FR	C3
360-9450	8200C-DR	C3
360-9537	6200D	D1
360-9538	8200D	D2
360-9539	12200D	D2
360-9614	12200G	D2

2. Bottom of balance / Gehäuse Unterteil



Key-No.	Part-No.	Description	Bezeichnung
1	320-3069	Blind plug	Blindzapfen
2	320-7139	Servo-motor compl.	Servomotor kpl.
3	320-7140	Calibration compl.	Kalibrierung kpl.
4	360-2002 *	Calibration plate	Eichplatte
5	360-7000	Housing's bottom	Gehäuse Unterteil
6	360-7004	Levelling screw compl.	Stellfuss kpl
7	360-7013	Graphic display EP series	Grafikdisplay Serie EP
8	360-7200-020	Main board → page B2	Hauptprint → page B2
9	360-7201-010	Connector board → page B3	Steckerprint → page B3
10	360-8009	Slide-in module standard RS 232	Einschub Standard RS 232
11	MW 2075-003	Sealing lenght 85mm	Dichtung Länge 85mm
12	PN 1100-041	Screw M4x5	ZS-Schraube M4x5
13	PN 1100-061	Screw M3x6	ZK-Schraube M3x6
14	PN 1100-062	Screw M3x8	ZK-Schraube M3x8
15	PN 1100-170	Screw M4x8	ZL-Schraube M4x8
16	PN 1100-176 **	Screw M4x12	ZS-Schraube M4x12
17	PN 1500-098	Spring washer 10x5.2x0.25 Cr	Tellerfeder 10x5.2x0.25 Cr
18	PN 3260-027	LCD Display ES series	LCD Display Serie ES
19	PN 3329-XXX	Measuring resistor see chart below	Messwiderstand siehe Tabelle unten
20	PN 3730-004	Levelling unit	Libelle

* Approved balances only / nur eichfähige Waagen

**Analytical- and Semi-micro balances only / nur Analyse- und Semimicrowaagen

2.1 Measuring resistor A2 / Messwiderstand A2

19	PN 3329-032	Measuring resistor 250 Ohm	Messwiderstand 250 Ohm

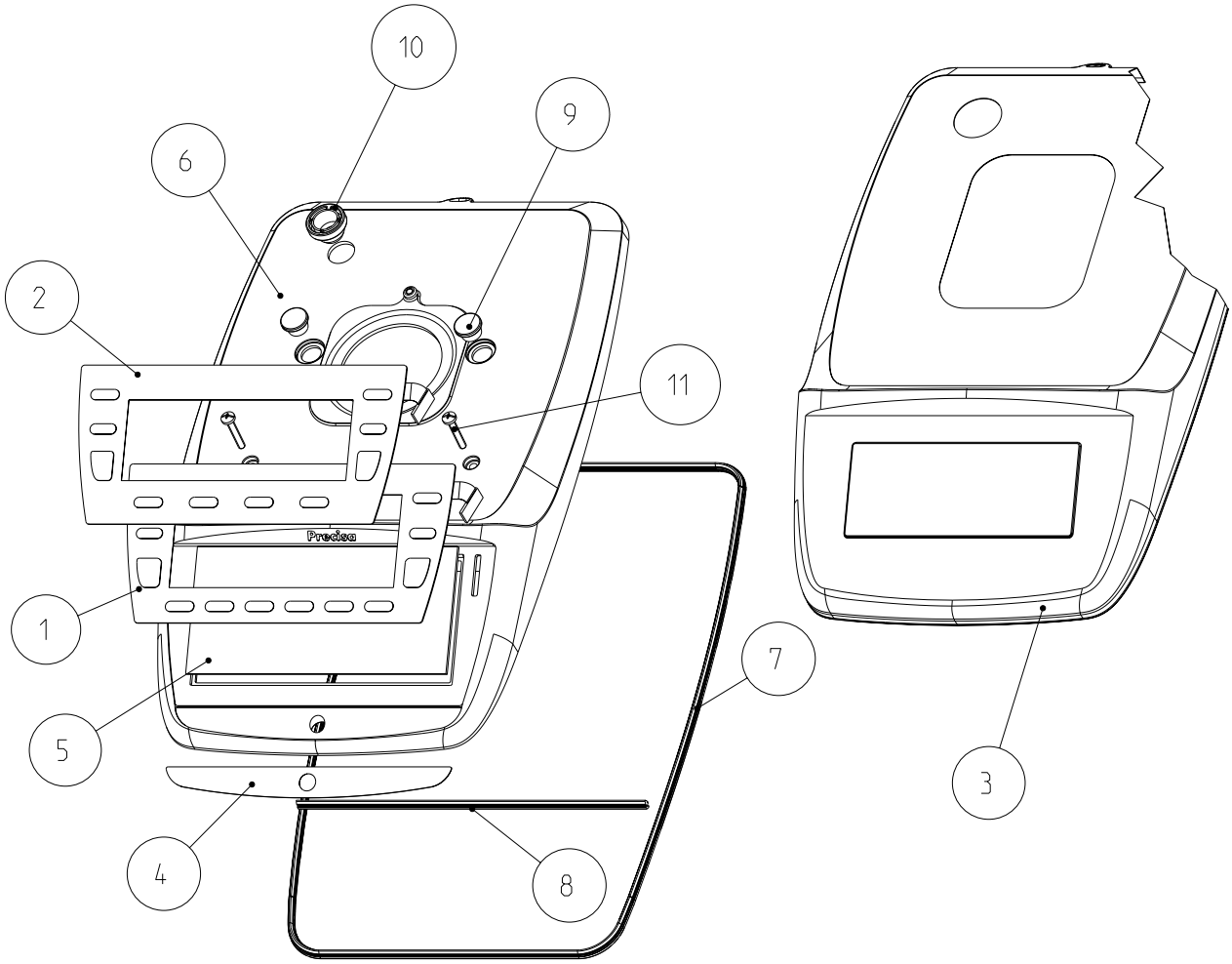
2.2 Measuring resistor A3 / Messwiderstand A3

19	PN 3329-031	Measuring resistor 150 Ohm	Messwiderstand 150 Ohm

2.3 Measuring resistor M, C, D / Messwiderstand M, C, D

19	PN 3329-028	Measuring resistor 51 Ohm	Messwiderstand 51 Ohm

3. Top of balance / Gehäuse Oberteil



Key-No.	Part-No.	Description	Bezeichnung
1	360-4000	Keypad EP	Folientastatur EP
2	360-4001	Keypad ES	Folientastatur ES
3	350-8676 *	Dustcover A/SM	Staubschutz A/SM
	350-8663 *	Dustcover M/C/D	Staubschutz M/C/D
4	page A 7	Label	Typenschild
5	360-4008	Glass	Displayglas
6	360-7011	Top of balance M/C/D	Gehäuse Oberteil M/C/D
	360-7017	Top of balance A/SM	Gehäuse Oberteil A/SM
7	MW 2075-003 **	Sealing lenght 1055mm	Dichtung Länge 1055mm
8	MW 2075-003 **	Sealing lenght 215mm	Dichtung Länge 215mm
9	PN 1053-012	Blind plug	Abdeckkappe
10	PN 1053-014 **	Blind plug	Schutzstopfen
11	PN 1100-227	Screw M4x25	ZK-Schraube M4x25

* set of 20 pieces / Set mit 20 Stück

**Analytical- and Semi-micro balances only / nur Analyse- und Semimicrowaagen

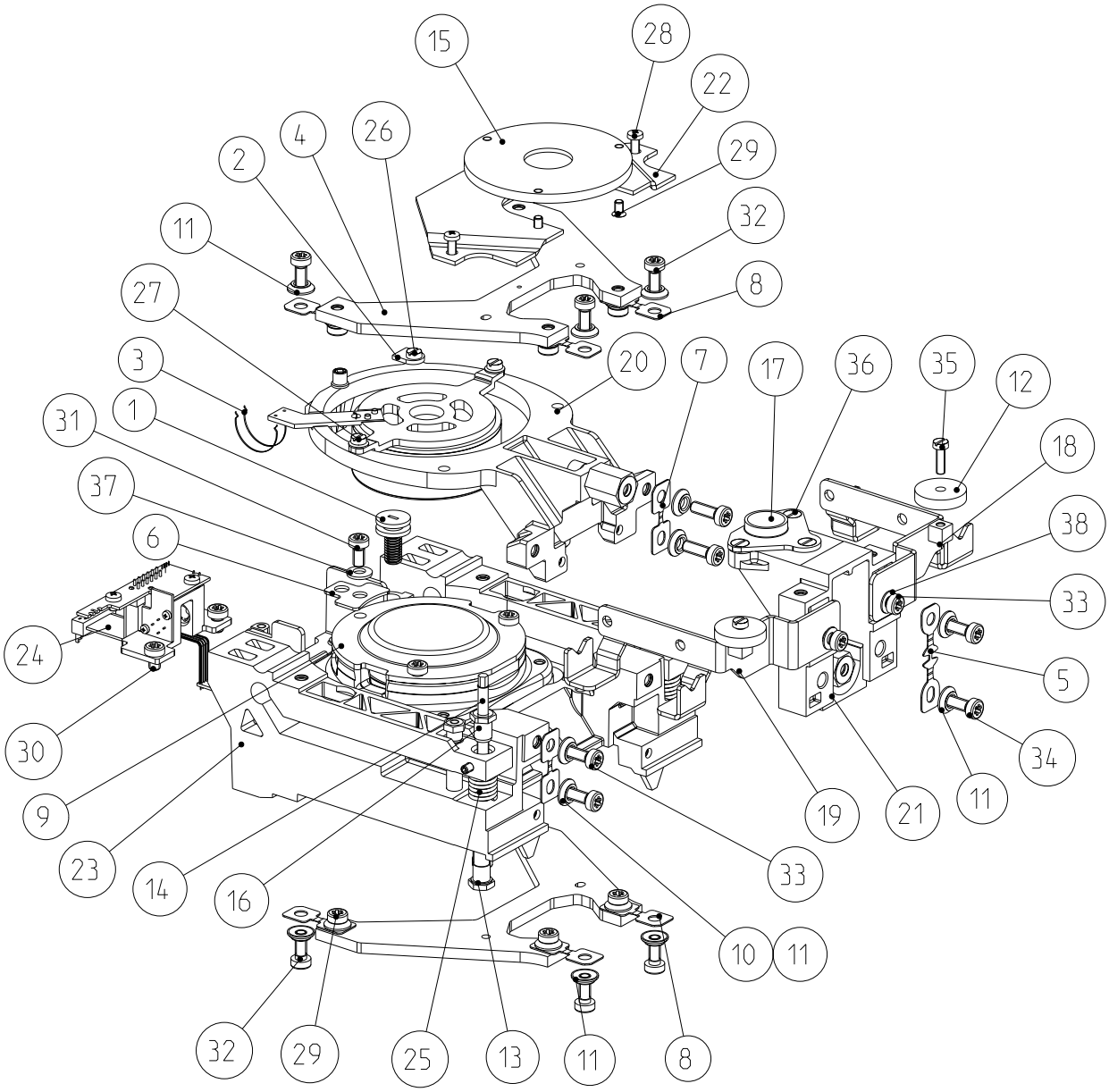
3.1 Labels Series 360 EP

360-7009-001	EP 125SM
360-7009-002	EP 160SM
360-7009-003	EP 125SM-FR
360-7009-004	EP 225SM-DR
360-7009-005	EP 120A
360-7009-006	EP 220A
360-7009-007	EP 320A
360-7009-008	EP 420A
360-7009-009	EP 420A-FR
360-7009-010	EP 620A-DR
360-7009-011	EP 320M
360-7009-012	EP 620M
360-7009-013	EP 920M
360-7009-014	EP 1220M
360-7009-015	EP 620M-FR
360-7009-016	EP 1220M-FR
360-7009-017	EP 3220M-DR
360-7009-018	EP 1220C
360-7009-019	EP 2200C
360-7009-020	EP 4200C
360-7009-021	EP 6200C
360-7009-022	EP 8200C
360-7009-023	EP 6200C-FR
360-7009-024	EP 8200C-DR
360-7009-025	EP 6200D
360-7009-026	EP 8200D
360-7009-027	EP 12200D
360-7009-028	EP 12200G

3.2 Labels Series 360 ES

360-7010-001	ES 125SM
360-7010-002	ES 160SM
360-7010-003	ES 125SM-FR
360-7010-004	ES 225SM-DR
360-7010-005	ES 120A
360-7010-006	ES 220A
360-7010-007	ES 320A
360-7010-008	ES 420A
360-7010-009	ES 420A-FR
360-7010-010	ES 620A-DR
360-7010-011	ES 320M
360-7010-012	ES 620M
360-7010-013	ES 920M
360-7010-014	ES 1220M
360-7010-015	ES 620M-FR
360-7010-016	ES 1220M-FR
360-7010-017	ES 3220M-DR
360-7010-018	ES 1220C
360-7010-019	ES 2200C
360-7010-020	ES 4200C
360-7010-021	ES 6200C
360-7010-022	ES 8200C
360-7010-023	ES 6200C-FR
360-7010-024	ES 8200C-DR
360-7010-025	ES 6200D
360-7010-026	ES 8200D
360-7010-027	ES 12200D
360-7010-028	ES 1220G

4. Weighing cell / Wägezelle



4.1 Group A2 / Gruppe A2

Key-No.	Part-No.	Description	Bezeichnung
1	240-4048	Symmetry screw	Symmetrieschraube
2	280-2003	Stopper	Anschlag
3	350-8325 *	Connecting wire set; 10pcs	Bronzeband Set; 10stk
4	320-2004	Flexure holder	Lenker
5	page A 17	Flexure strap Be 1.2mm	Zugband Be 1.2mm
6	320-2032	Transport safety device	Transportsicherung
7	page A 17	Flexure sheet Be 2mm	Hängelager Be 2mm
8	page A 17	Flexure sheet Be 3mm	Biegelager Be 3mm
9	320-2048	Magnet cover	Magnettopfdeckel
11	320-3055	Base	Beilage
12	320-3056	Preload weight	Vorlastgewicht XR
13	320-3067	Insert	Gewindebüchse
14	320-3070	Differential set screw	Differential Gewindestift
15	320-3080	Cover air draft	Deckel Luftzug
16	320-3081	Corner load bush	Eckenlastbuchse
17	320-7130	Inner cone round	Innenkonus rund
18	320-7145	Weight holder left compl.	Gewichtslager links kpl.
19	320-7147	Weight holder right compl.	Gewichtslager rechts kpl.
20	360-7036	Balance arm 1:4.5 compl.	Waagbalken 1:4.5 kpl.
21	360-7031	Support piece 1:4.5 compl.	Träger 1:4.5 kpl.
22	360-2001	Cover holder	Deckelträger
23	360-5002	Chassis	Chassis
24	360-7005	Sensor mechanism compl.	Lichtschranke kpl.
25	F2-152	Spring	Feder
26	PN 1100-039	Screw M3x5	ZS-Schraube M3x5
27	PN 1100-040	Screw M3x8	ZS-Schraube M3x8
28	PN 1100-061	Screw M3x6	ZK-Schraube M3x6
29	PN 1100-106	Screw M3x5	SS-Schraube M3x5 kl. Kopf
30	PN 1100-169	Screw M4x6	ZL-Schraube M4x6
31	PN 1100-170	Screw M4x8	ZL-Schraube M4x8
32	PN 1100-171	Screw M4x10	ZL-Schraube M4x10
33	PN 1100-172	Screw M4x12	ZL-Schraube M4x12
34	PN 1100-172	Screw M4x12	ZL-Schraube M4x12
35	PN 1100-266	Screw M3x10	ZS-Schraube M3x10
36	PN 1100-286	Screw M3x10	SS-Schraube M4x6 kl. Kopf
37	PN 1500-075	Spring washer M4	Tellerfeder M4
38	PN 1500-097	Washer M4 Ms	U-Scheibe M4 Ms

* set of 10 pieces / Set mit 10 Stück

4.2 Group A3 / Gruppe A3

Key-No.	Part-No.	Description	Bezeichnung
1	240-4048	Symmetry screw	Symmetrieschraube
2	280-2003	Stopper	Anschlag
3	350-8325 *	Connecting wire set; 10pcs	Bronzeband Set; 10stk
4	320-2004	Flexure holder	Lenker
5	page A 17	Flexure strap Be 1.2mm	Zugband Be 1.2mm
6	320-2032	Transport safety device	Transportsicherung
7	page A 17	Flexure sheet Be 2mm	Hängelager Be 2mm
8	page A 17	Flexure sheet Be 3mm	Biegelager Be 3mm
9	320-2048	Magnet cover	Magnettopfdeckel
11	320-3055	Base	Beilage
12	320-3056	Preload weight	Vorlastgewicht XR
13	320-3067	Insert	Gewindebüchse
14	320-3070	Differential set screw	Differential Gewindestift
15	320-3080	Cover air draft	Deckel Luftzug
16	320-3081	Corner load bush	Eckenlastbuchse
17	320-7130	Inner cone round	Innenkonus rund
18	320-2076	Weight holder left	Gewichtslager links
19	320-2077	Weight holder right	Gewichtslager rechts
20	360-7038	Balance arm 1:6 compl.	Waagbalken 1:6 kpl.
21	360-7032	Support piece 1:6 compl.	Träger 1:6 kpl.
22	360-2001	Cover holder	Deckelträger
23	360-5002	Chassis	Chassis
24	360-7005	Sensor mechanism compl.	Lichtschranke kpl.
25	F2-152	Spring	Feder
26	PN 1100-039	Screw M3x5	ZS-Schraube M3x5
27	PN 1100-040	Screw M3x8	ZS-Schraube M3x8
28	PN 1100-061	Screw M3x6	ZK-Schraube M3x6
29	PN 1100-106	Screw M3x5	SS-Schraube M3x5 kl. Kopf
30	PN 1100-169	Screw M4x6	ZL-Schraube M4x6
31	PN 1100-170	Screw M4x8	ZL-Schraube M4x8
32	PN 1100-171	Screw M4x10	ZL-Schraube M4x10
33	PN 1100-172	Screw M4x12	ZL-Schraube M4x12
34	PN 1100-171	Screw M4x10	ZL-Schraube M4x10
35	PN 1100-266	Screw M3x10	ZS-Schraube M3x10
36	PN 1100-286	Screw M3x10	SS-Schraube M4x6 kl. Kopf
37	PN 1500-075	Spring washer M4	Tellerfeder M4
38	PN 1500-097	Washer M4 Ms	U-Scheibe M4 Ms

* set of 10 pieces / Set mit 10 Stück

4.3 Group M1 / Gruppe M1

Key-No.	Part-No.	Description	Bezeichnung
1	240-4048	Symmetry screw	Symmetrieschraube
2	280-2003	Stopper	Anschlag
3	350-8325 *	Connecting wire set; 10pcs	Bronzeband Set; 10stk
4	320-2004	Flexure holder	Lenker
5	page A 17	Flexure strap Th 1.2mm	Zugband Th 1.2mm
6	320-2032	Transport safety device	Transportsicherung
7	page A 17	Flexure sheet Th 3mm	Hängelager Th 3mm
8	page A 17	Flexure sheet Th 3mm	Biegelager Th 3mm
9	320-2048	Magnet cover	Magnettopfdeckel
10	320-3013	Base	Beilage
11	PN 1500-075	Spring washer M4	Tellerfeder M4
14	360-3000	Corner load screw	Eckenlastschraube
17	360-5003	Inner cone 4kt	Innenkonus 4kt
18	320-2076	Weight holder left	Gewichtslager links
19	320-2077	Weight holder right	Gewichtslager rechts
20	360-7038	Balance arm 1:6 compl.	Waagbalken 1:6 kpl.
21	360-7032	Support piece 1:6 compl.	Träger 1:6 kpl.
23	360-5002	Chassis	Chassis
24	360-7005	Sensor mechanism compl.	Lichtschranke kpl.
25	F2-152	Spring	Feder
26	PN 1100-039	Screw M3x5	ZS-Schraube M3x5
27	PN 1100-040	Screw M3x8	ZS-Schraube M3x8
30	PN 1100-169	Screw M4x6	ZL-Schraube M4x6
31	PN 1100-170	Screw M4x8	ZL-Schraube M4x8
32	PN 1100-171	Screw M4x10	ZL-Schraube M4x10
33	PN 1100-172	Screw M4x12	ZL-Schraube M4x12
34	PN 1100-172	Screw M4x12	ZL-Schraube M4x12
36	PN 1100-286	Screw M3x10	SS-Schraube M4x6 kl. Kopf
37	PN 1500-075	Spring washer M4	Tellerfeder M4
38	PN 1500-075	Spring washer M4	Tellerfeder M4

* set of 10 pieces / Set mit 10 Stück

4.4 Group M2 / Gruppe M2

Key-No.	Part-No.	Description	Bezeichnung
1	240-4048	Symmetry screw	Symmetrieschraube
2	280-2003	Stopper	Anschlag
3	350-8325 *	Connecting wire set; 10pcs	Bronzeband Set; 10stk
4	320-2004	Flexure holder	Lenker
5	page A 17	Flexure strap Th 1.2mm	Zugband Th 1.2mm
6	320-2032	Transport safety device	Transportsicherung
7	page A 17	Flexure sheet Th 3mm	Hängelager Th 3mm
8	page A 17	Flexure sheet Th 3mm	Biegelager Th 3mm
9	320-2048	Magnet cover	Magnettopfdeckel
10	320-3013	Base	Beilage
11	PN 1500-075	Spring washer M4	Tellerfeder M4
14	360-3000	Corner load screw	Eckenlastschraube
17	360-5003	Inner cone 4kt	Innenkonus 4kt
18	320-2076	Weight holder left	Gewichtslager links
19	320-2077	Weight holder right	Gewichtslager rechts
20	360-7040	Balance arm 1:12 compl.	Waagbalken 1:12 kpl.
21	360-7033	Support piece 1:12 compl.	Träger 1:12 kpl.
23	360-5002	Chassis	Chassis
24	360-7005	Sensor mechanism compl.	Lichtschranke kpl.
25	F2-152	Spring	Feder
26	PN 1100-039	Screw M3x5	ZS-Schraube M3x5
27	PN 1100-040	Screw M3x8	ZS-Schraube M3x8
30	PN 1100-169	Screw M4x6	ZL-Schraube M4x6
31	PN 1100-170	Screw M4x8	ZL-Schraube M4x8
32	PN 1100-171	Screw M4x10	ZL-Schraube M4x10
33	PN 1100-172	Screw M4x12	ZL-Schraube M4x12
34	PN 1100-173	Screw M4x16	ZL-Schraube M4x16
36	PN 1100-286	Screw M3x10	SS-Schraube M4x6 kl. Kopf
37	PN 1500-075	Spring washer M4	Tellerfeder M4
38	PN 1500-075	Spring washer M4	Tellerfeder M4

* set of 10 pieces / Set mit 10 Stück

4.5 Group C2 / Gruppe C2

Key-No.	Part-No.	Description	Bezeichnung
1	240-4048	Symmetry screw	Symmetrieschraube
2	280-2003	Stopper	Anschlag
3	350-8325 *	Connecting wire set; 10pcs	Bronzeband Set; 10stk
4	320-2004	Flexure holder	Lenker
5	page A 17	Flexure strap Th 1.6mm	Zugband Th 1.6mm
6	320-2032	Transport safety device	Transportsicherung
7	page A 17	Flexure sheet Th 3mm	Hängelager Th 3mm
8	page A 17	Flexure sheet Th 3mm	Biegelager Th 3mm
9	320-2048	Magnet cover	Magnettopfdeckel
10	320-3013	Base	Beilage
11	PN 1500-075	Spring washer M4	Tellerfeder M4
14	360-3000	Corner load screw	Eckenlastschraube
17	360-5003	Inner cone 4kt	Innenkonus 4kt
18	320-2076	Weight holder left	Gewichtslager links
19	320-2077	Weight holder right	Gewichtslager rechts
20	360-7039	Balance arm 1:12 compl.	Waagbalken 1:12 kpl.
21	360-7033	Support piece 1:12 compl.	Träger 1:12 kpl.
23	360-5002	Chassis	Chassis
24	360-7005	Sensor mechanism compl.	Lichtschranke kpl.
25	F2-152	Spring	Feder
26	PN 1100-039	Screw M3x5	ZS-Schraube M3x5
27	PN 1100-040	Screw M3x8	ZS-Schraube M3x8
30	PN 1100-169	Screw M4x6	ZL-Schraube M4x6
31	PN 1100-170	Screw M4x8	ZL-Schraube M4x8
32	PN 1100-171	Screw M4x10	ZL-Schraube M4x10
33	PN 1100-172	Screw M4x12	ZL-Schraube M4x12
34	PN 1100-173	Screw M4x16	ZL-Schraube M4x16
36	PN 1100-286	Screw M3x10	SS-Schraube M4x6 kl. Kopf
37	PN 1500-075	Spring washer M4	Tellerfeder M4
38	PN 1500-075	Spring washer M4	Tellerfeder M4

* set of 10 pieces / Set mit 10 Stück

4.6 Group C3 / Gruppe C3

Key-No.	Part-No.	Description	Bezeichnung
1	240-4048	Symmetry screw	Symmetrieschraube
2	280-2003	Stopper	Anschlag
3	350-8325 *	Connecting wire set; 10pcs	Bronzeband Set; 10stk
4	320-2004	Flexure holder	Lenker
5	page A 17	Flexure strap Th 1.6mm	Zugband Th 1.6mm
6	320-2032	Transport safety device	Transportsicherung
7	page A 17	Flexure sheet Th 3mm	Hängelager Th 3mm
8	page A 17	Flexure sheet Th 6mm	Biegelager Th 6mm
9	320-2048	Magnet cover	Magnettopfdeckel
10	320-3013	Base	Beilage
11	PN 1500-075	Spring washer M4	Tellerfeder M4
14	360-3000	Corner load screw	Eckenlastschraube
17	360-5003	Inner cone 4kt	Innenkonus 4kt
18	320-2076	Weight holder left	Gewichtslager links
19	320-2077	Weight holder right	Gewichtslager rechts
20	360-7041	Balance arm 1:36 compl.	Waagbalken 1:36 kpl.
21	360-7034	Support piece 1:36 compl.	Träger 1:36 kpl.
23	360-5002	Chassis	Chassis
24	360-7005	Sensor mechanism compl.	Lichtschranke kpl.
25	F2-152	Spring	Feder
26	PN 1100-039	Screw M3x5	ZS-Schraube M3x5
27	PN 1100-040	Screw M3x8	ZS-Schraube M3x8
30	PN 1100-169	Screw M4x6	ZL-Schraube M4x6
31	PN 1100-170	Screw M4x8	ZL-Schraube M4x8
32	PN 1100-171	Screw M4x10	ZL-Schraube M4x10
33	PN 1100-172	Screw M4x12	ZL-Schraube M4x12
34	PN 1100-172	Screw M4x12	ZL-Schraube M4x12
36	PN 1100-286	Screw M3x10	SS-Schraube M4x6 kl. Kopf
37	PN 1500-075	Spring washer M4	Tellerfeder M4
38	PN 1500-075	Spring washer M4	Tellerfeder M4

* set of 10 pieces / Set mit 10 Stück

4.7 Group D1 / Gruppe D1

Key-No.	Part-No.	Description	Bezeichnung
1	240-4048	Symmetry screw	Symmetrieschraube
2	280-2003	Stopper	Anschlag
3	350-8325 *	Connecting wire set; 10pcs	Bronzeband Set; 10stk
4	320-2004	Flexure holder	Lenker
5	page A 17	Flexure strap Th 1.6mm	Zugband Th 1.6mm
6	320-2032	Transport safety device	Transportsicherung
7	page A 17	Flexure sheet Th 6mm	Hängelager Th 6mm
8	page A 17	Flexure sheet Th 6mm	Biegelager Th 6mm
9	320-2048	Magnet cover	Magnettopfdeckel
10	320-3013	Base	Beilage
11	PN 1500-075	Spring washer M4	Tellerfeder M4
14	360-3000	Corner load screw	Eckenlastschraube
17	360-5003	Inner cone 4kt	Innenkonus 4kt
18	320-2076	Weight holder left	Gewichtslager links
19	320-2077	Weight holder right	Gewichtslager rechts
20	360-7041	Balance arm 1:36 compl.	Waagbalken 1:36 kpl.
21	360-7034	Support piece 1:36 compl.	Träger 1:36 kpl.
23	360-5002	Chassis	Chassis
24	360-7005	Sensor mechanism compl.	Lichtschranke kpl.
25	F2-152	Spring	Feder
26	PN 1100-039	Screw M3x5	ZS-Schraube M3x5
27	PN 1100-040	Screw M3x8	ZS-Schraube M3x8
30	PN 1100-169	Screw M4x6	ZL-Schraube M4x6
31	PN 1100-170	Screw M4x8	ZL-Schraube M4x8
32	PN 1100-171	Screw M4x10	ZL-Schraube M4x10
33	PN 1100-172	Screw M4x12	ZL-Schraube M4x12
34	PN 1100-172	Screw M4x12	ZL-Schraube M4x12
36	PN 1100-286	Screw M3x10	SS-Schraube M4x6 kl. Kopf
37	PN 1500-075	Spring washer M4	Tellerfeder M4
38	PN 1500-075	Spring washer M4	Tellerfeder M4

* set of 10 pieces / Set mit 10 Stück

4.8 Group D2 / Gruppe D2

Key-No.	Part-No.	Description	Bezeichnung
1	240-4048	Symmetry screw	Symmetrieschraube
2	280-2003	Stopper	Anschlag
3	350-8325 *	Connecting wire set; 10pcs	Bronzeband Set; 10stk
4	320-2004	Flexure holder	Lenker
5	page A 17	Flexure strap Th 1.6mm	Zugband Th 1.6mm
6	320-2032	Transport safety device	Transportsicherung
7	page A 17	Flexure sheet Th 6mm	Hängelager Th 6mm
8	page A 17	Flexure sheet Th 6mm	Biegelager Th 6mm
9	320-2048	Magnet cover	Magnettopfdeckel
10	320-3013	Base	Beilage
11	PN 1500-075	Spring washer M4	Tellerfeder M4
14	360-3000	Corner load screw	Eckenlastschraube
17	360-5003	Inner cone 4kt	Innenkonus 4kt
18	320-2076	Weight holder left	Gewichtslager links
19	320-2077	Weight holder right	Gewichtslager rechts
20	360-7042	Balance arm 1:60 compl.	Waagbalken 1:60 kpl.
21	360-7035	Support piece 1:60 compl.	Träger 1:60 kpl.
23	360-5002	Chassis	Chassis
24	360-7005	Sensor mechanism compl.	Lichtschranke kpl.
25	F2-152	Spring	Feder
26	PN 1100-039	Screw M3x5	ZS-Schraube M3x5
27	PN 1100-040	Screw M3x8	ZS-Schraube M3x8
30	PN 1100-169	Screw M4x6	ZL-Schraube M4x6
31	PN 1100-170	Screw M4x8	ZL-Schraube M4x8
32	PN 1100-171	Screw M4x10	ZL-Schraube M4x10
33	PN 1100-172	Screw M4x12	ZL-Schraube M4x12
34	PN 1100-172	Screw M4x12	ZL-Schraube M4x12
36	PN 1100-286	Screw M3x10	SS-Schraube M4x6 kl. Kopf
37	PN 1500-075	Spring washer M4	Tellerfeder M4
38	PN 1500-075	Spring washer M4	Tellerfeder M4

* set of 10 pieces / Set mit 10 Stück

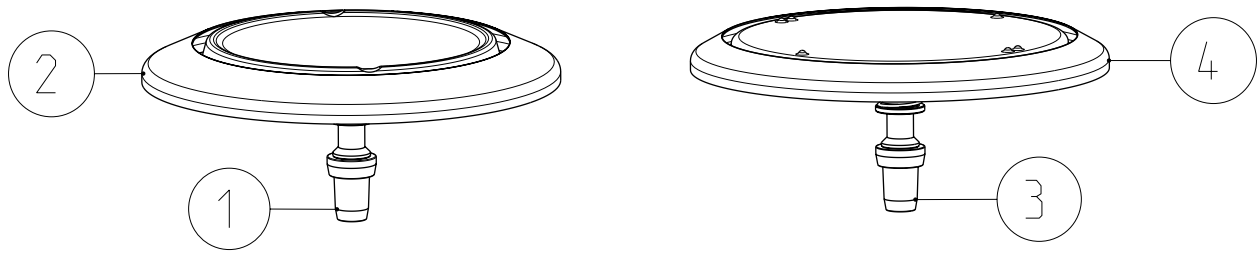
4.9 Overview of flexure sheet repair set / Übersicht der Reparatur-Lagersets

Group/Gruppe	Description	Bezeichnung	Set-No.
A2/A3	Flexure sheet set containing: 1 x key 5 2 x key 7 8 x key 8	Lagerset beinhaltet: 1 x Pos.5 2 x Pos.7 8 x Pos.8	350-8593
M1/M2	Flexure sheet set containing: 1 x key 5 2 x key 7 8 x key 8	Lagerset beinhaltet: 1 x Pos.5 2 x Pos.7 8 x Pos.8	350-8592
C2/C3	Flexure sheet set containing: 1 x key 5 2 x key 7 8 x key 8	Lagerset beinhaltet: 1 x Pos.5 2 x Pos.7 8 x Pos.8	350-8594
D1/D2	Flexure sheet set containing: 1 x key 5 2 x key 7 8 x key 8	Lagerset beinhaltet: 1 x Pos.5 2 x Pos.7 8 x Pos.8	350-8595

4.10 Overview of flexure sheets / Übersicht der Biegelager

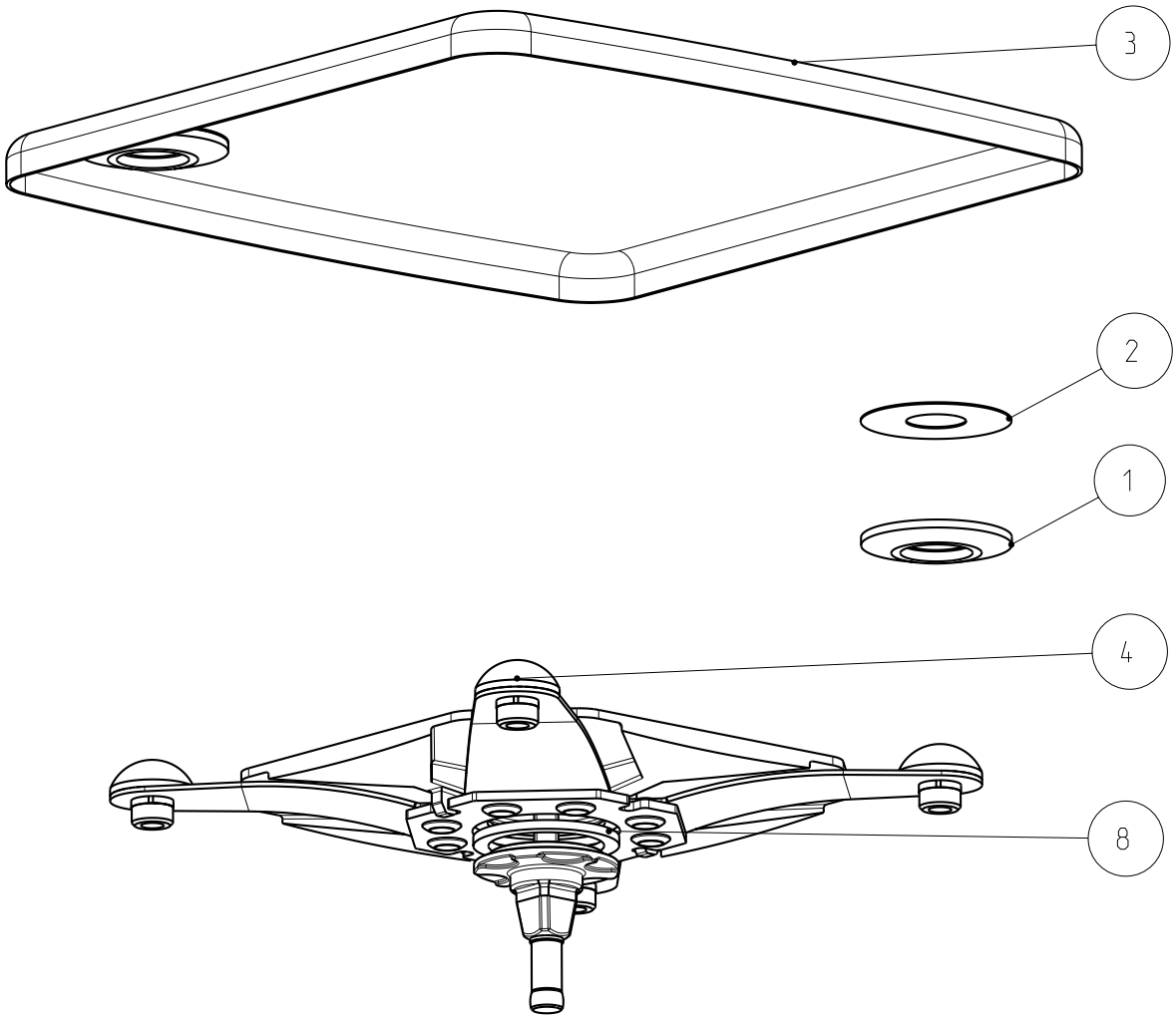
Group/Gruppe	Key-No.	Description	Bezeichnung	Set-No.	Pcs./Set
A2	3	Flexure strap Be 1.2mm	Zugband Be 1.2mm	350-8539	5
A3	3	Flexure strap Be 1.2mm	Zugband Be 1.2mm	350-8539	5
M1	3	Flexure strap Th 1.2mm	Zugband Th 1.2mm	350-8540	5
M2	3	Flexure strap Th 1.2mm	Zugband Th 1.2mm	350-8540	5
C2	3	Flexure strap Th 1.6mm	Zugband Th 1.6mm	350-8541	5
C3	3	Flexure strap Th 1.6mm	Zugband Th 1.6mm	350-8541	5
D1	3	Flexure strap Th 1.6mm	Zugband Th 1.6mm	350-8541	5
D2	3	Flexure strap Th 1.6mm	Zugband Th 1.6mm	350-8541	5
A2	7	V-Flexure sheet Be 2mm	Hängelager Be 2mm	350-8542	10
A3	7	V-Flexure sheet Be 2mm	Hängelager Be 2mm	350-8542	10
M1	7	V-Flexure sheet Th 3mm	Hängelager Th 3mm	350-8543	10
M2	7	V-Flexure sheet Th 3mm	Hängelager Th 3mm	350-8543	10
C2	7	V-Flexure sheet Th 3mm	Hängelager Th 3mm	350-8543	10
C3	7	V-Flexure sheet Th 3mm	Hängelager Th 3mm	350-8543	10
D1	7	V-Flexure sheet Th 6mm	Hängelager Th 6mm	350-8544	10
D2	7	V-Flexure sheet Th 6mm	Hängelager Th 6mm	350-8544	10
A2	8	H-Flexure sheet Be 3mm	Biegelager Be 3mm	350-8545	20
A3	8	H-Flexure sheet Be 3mm	Biegelager Be 3mm	350-8545	20
M1	8	H-Flexure sheet Th 3mm	Biegelager Th 3mm	350-8546	20
M2	8	H-Flexure sheet Th 3mm	Biegelager Th 3mm	350-8546	20
C2	8	H-Flexure sheet Th 6mm	Biegelager Th 6mm	350-8547	20
C3	8	H-Flexure sheet Th 6mm	Biegelager Th 6mm	350-8547	20
D1	8	H-Flexure sheet Th 6mm	Biegelager Th 6mm	350-8548	20
D2	8	H-Flexure sheet Th 6mm	Biegelager Th 6mm	350-8548	20

5. Weighing pan Group A / Waagschale Gruppe A



Key-No.	Part-No.	Description	Bezeichnung
1	360-8021	Weighing pan compl. D80 Semimicro balances	Waagschale kpl. D80 Semimicro-Waagen
2	360-2036	Protective ring D80 Semimicro balances	Schutzring D80 Semimicro-Waagen
3	360-8017	Weighing pan compl. D90 Analytical balances	Waagschale kpl. D90 Analysenwaagen
4	360-2016	Protective ring D90 Analytical balances	Schutzring D90 Analysenwaagen

6. Weighing pan 135 Group M / Waagschale 135 Gruppe M



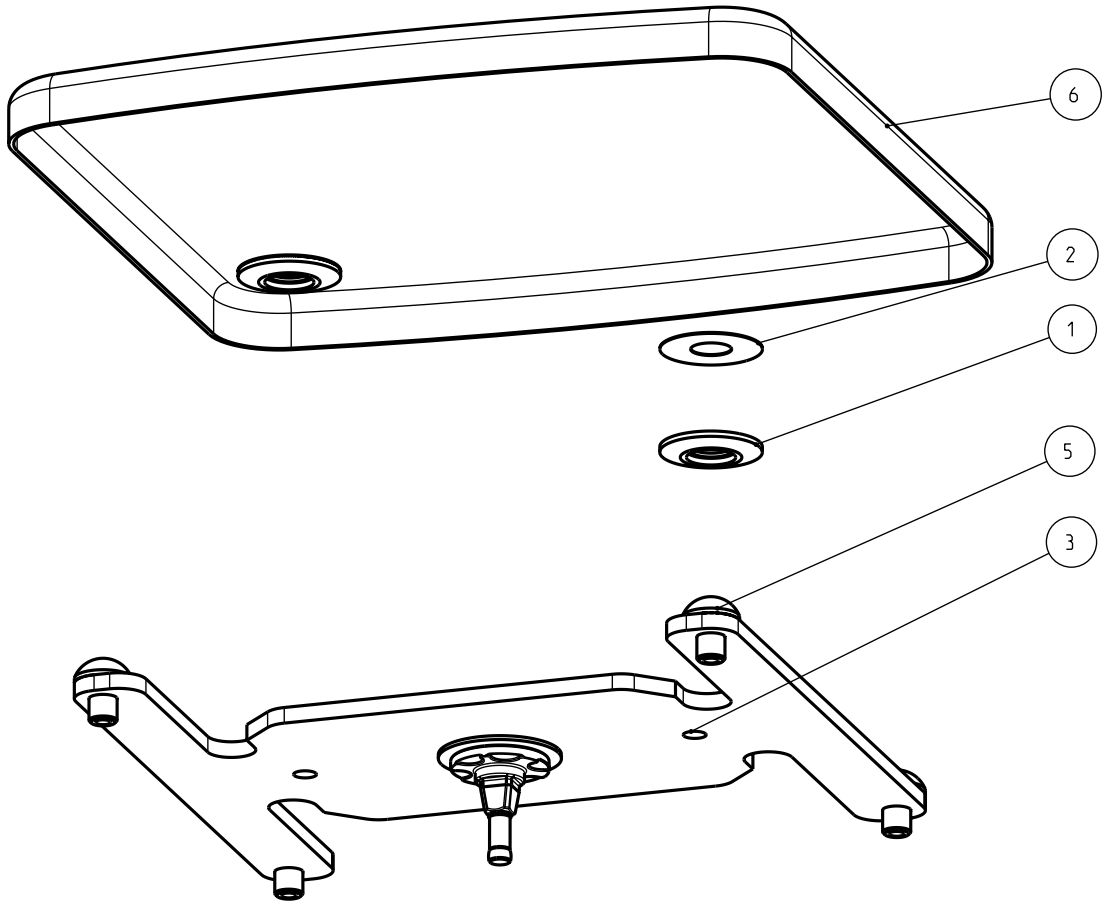
6.1 Group / Gruppe M1

Key-No.	Part-No.	Description	Bezeichnung
1	300-4059	Centring disk	Zentrierteller
2	300-4060	Adhesive disk	Kleber für Waagschale
3	320-7014	Weighing pan 135	Waagschale 135
4	320-4047	Centring bolt	Zentrierzapfen
8	320-3038	Adapter	Adapter
5	360-8014	Pan holder compl.	Schalenträger kpl.

6.2 Group / Gruppe M2

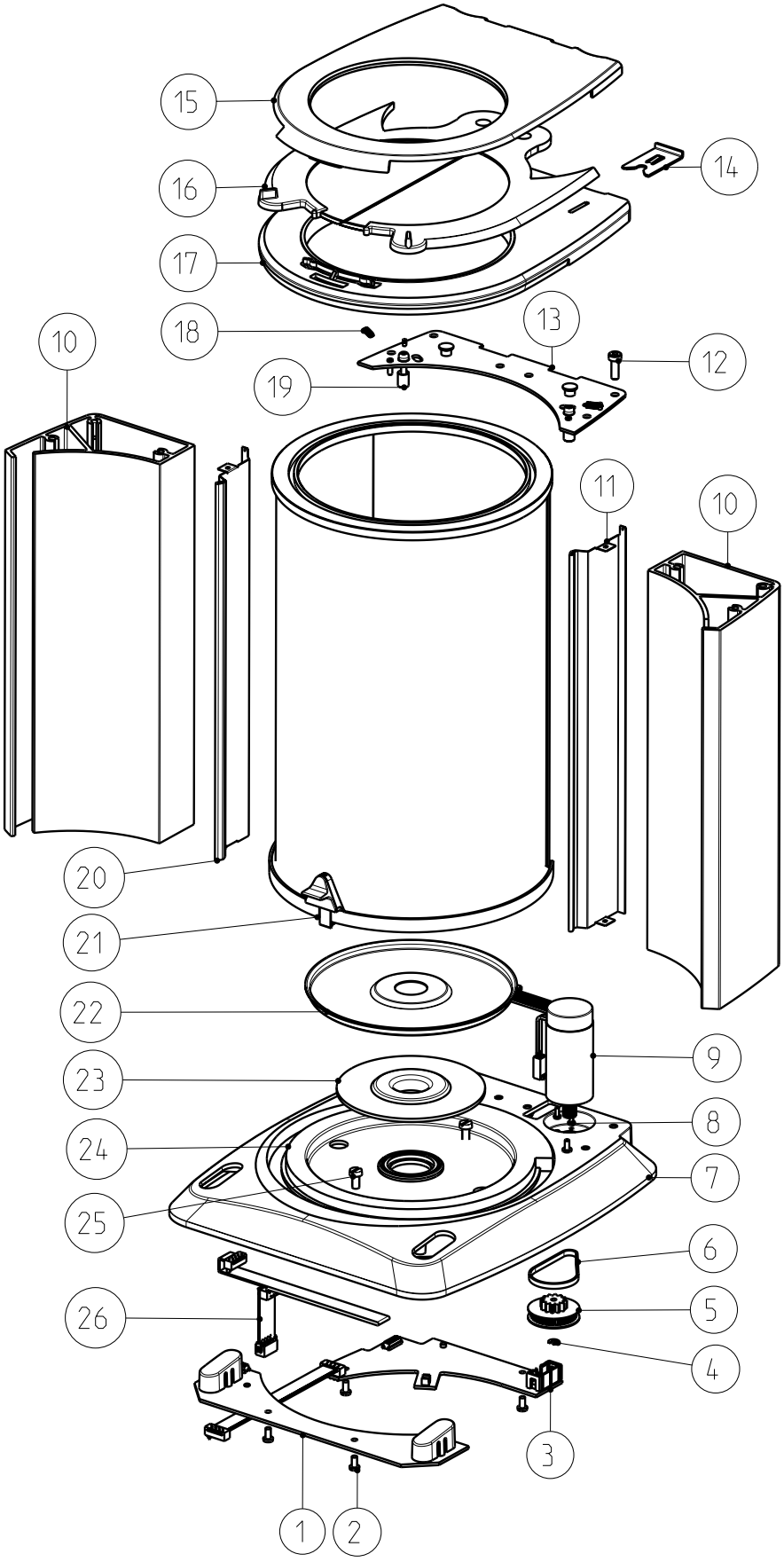
Key-No.	Part-No.	Description	Bezeichnung
1	300-4059	Centring disk	Zentrierteller
2	300-4060	Adhesive disk	Kleber für Waagschale
3	320-7014	Weighing pan 135	Waagschale 135
4	320-4047	Centring bolt	Zentrierzapfen
8	320-3038	Adapter	Adapter
5	360-8015	Pan holder compl.	Schalenträger kpl.

7. Weighing pan 200 Group C,D / Waagschale 200 Gruppe C,D



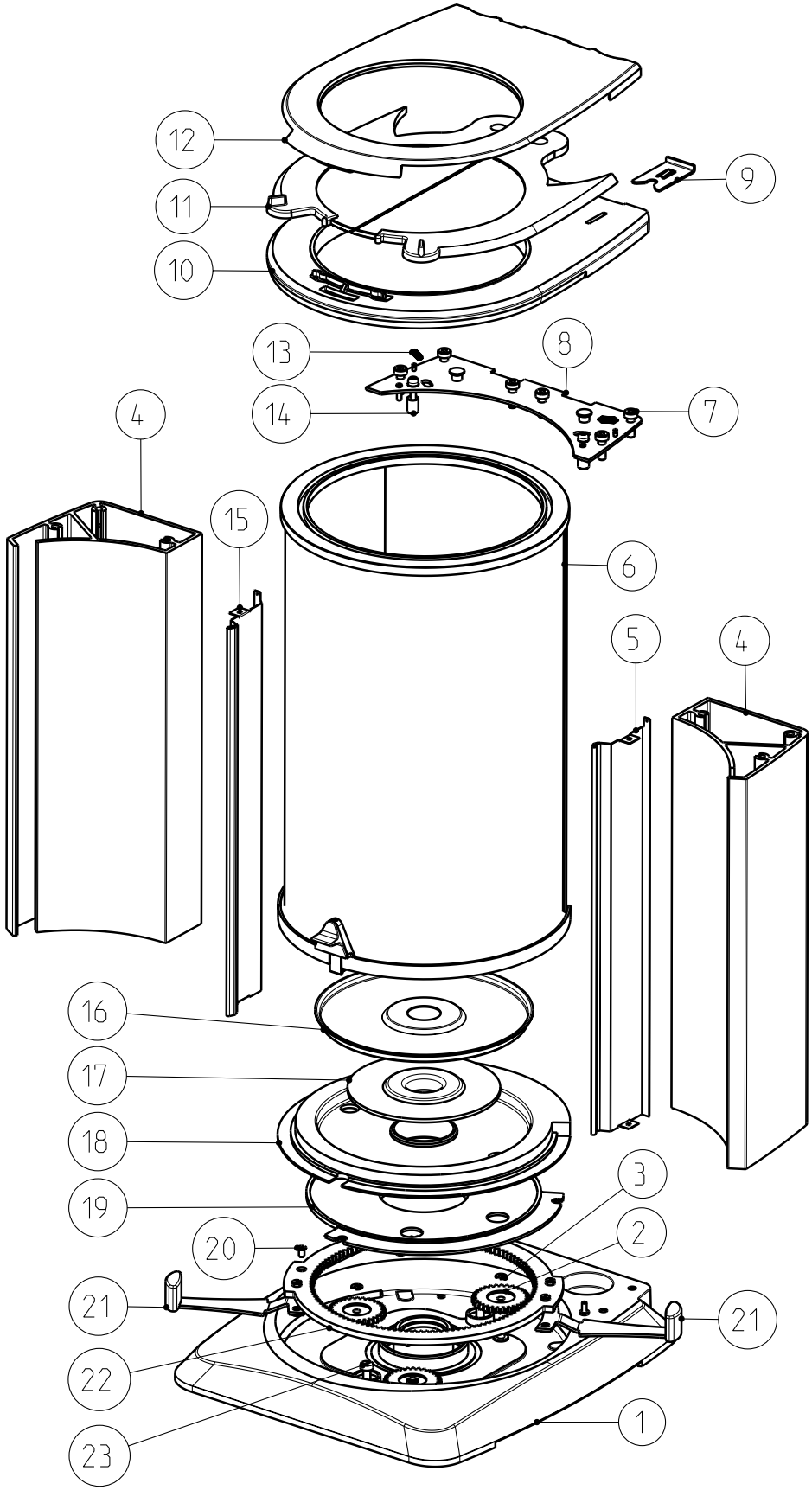
Key-No.	Part-No.	Description	Bezeichnung
1	300-4059	Centring disk	Zentrierteller
2	300-4060	Adhesive disk	Kleber für Waagschale
3 + 5	320-7003	Pan holder compl.	Schalenträger kpl.
5	320-4048	Centring bolt	Zentrierzapfen
6	320-7012	Weighing pan 200	Waagschale 200

8. Windshield EP / Windschutz EP 350-8657



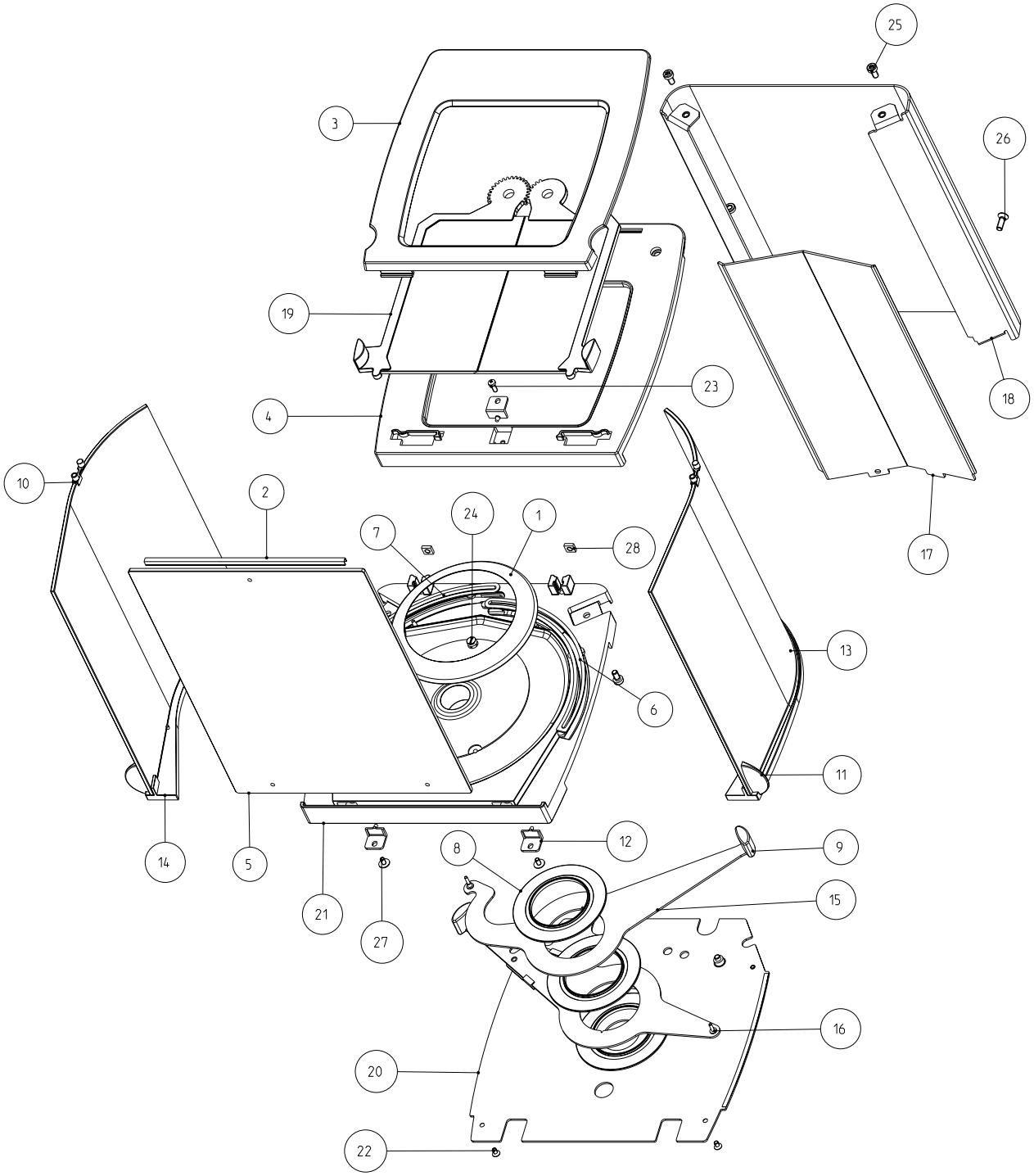
Key-No.	Part-No.	Description	Bezeichnung
1	360-7217-020	Sensor board cpl.	Sensorprint kpl.
2	PN 1100-061	Screw M3x6	ZK-Schraube M3x6
3	360-7216-020	Main board windshield cpl.	Hauptprint Windschutz kpl.
4	PN 1024-003	Lock washer D2,3	Sicherungsscheibe D2,3
5	360-4054	Gear	Kombizahnrad
6	PN 1056-002	Belt	Zahnriemen
7	360-7048	Bottom of windshield EP cpl.	Windschutzboden EP kpl.
8	PN 1100-279	Screw M2x5	ZK-Schraube M2x5
9	360-7050	Driving motor cpl.	Antriebsmotor kpl.
10	360-7045	Windshield profile coated	Windschutzprofil lackiert
11	360-7056	Lip seal right cpl.	Dichtlippe rechts kpl.
12	PN 1100-080	Screw M4x12	ZI-Schraube M4x12
13	360-7047	Holding plate cpl.	Halteblech kpl.
14	360-2014	Slide	Schieber
15	360-4050	Upper cover	Abdeckung oben
16	360-7024	Upper glasses cpl.	Gläser oben kpl.
17	360-4053	Windshield cover	Windschutzdeckel
18	F1-307	Spring	Zugfeder
19	360-7052	Excenter cpl.	Excenter kpl.
20	360-7055	Lip seal left cpl.	Dichtlippe links kpl.
21	360-7046	Glastube cpl.	Glasrohr kpl.
22	360-2029	Inner plate	Einlageblech
23	360-5021	Support	Auflage
24	360-7053	Rotary disc cpl.	Drehteller EP kpl.
25	PN 1100-080	Screw M4x8	ZS-Schraube M4x8
26	360-7218-020	Adapter board cpl.	Adapterprint kpl.

9. Windshield ES / Windschutz ES 350-8659



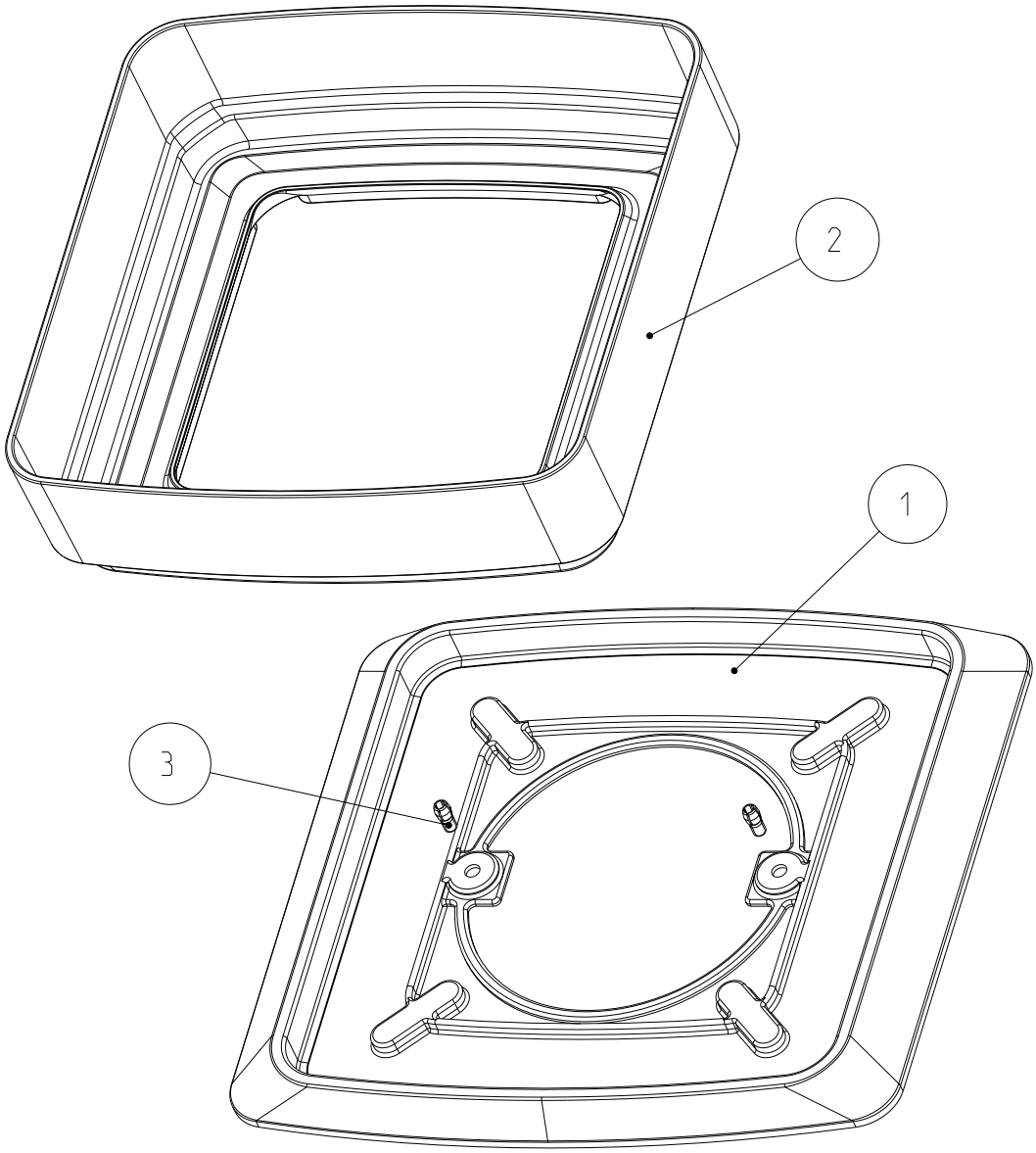
Key-No.	Part-No.	Description	Bezeichnung
1	360-7043	Bottom of windshield ES cpl.	Windschutzboden ES kpl.
2	360-4047	Planet	Planetenzahnrad
3	PN 1024-003	Lock washer D2,3	Sicherungsscheibe D2,3
4	360-7045	Windshield profile coated	Windschutzprofil lackiert
5	360-7056	Lip seal right cpl.	Dichtlippe rechts kpl.
6	360-7046	Glastube cpl.	Glasrohr kpl.
7	PN 1100-080	Screw M4x12	ZI-Schraube M4x12
8	360-7047	Holding plate cpl.	Halteblech kpl.
9	360-2014	Slide	Schieber
10	360-4053	Windshield cover	Windschutzdeckel
11	360-7024	Upper glasses cpl.	Gläser oben kpl.
12	360-4050	Upper cover	Abdeckung oben
13	F1-307	Spring	Zugfeder
14	360-7052	Excenter cpl.	Excenter kpl.
15	360-7055	Lip seal left cpl.	Dichtlippe links kpl.
16	360-2029	Inner plate	Einlageblech
17	360-5021	Support	Auflage
18	360-7054	Rotary disc ES cpl.	Drehteller ES kpl.
19	360-4056	Carrier	Mitnehmer
20	PN 1100-106	Screw M3x5	SS-Schraube M3x5
21	360-7018	Lever cpl.	Hebel kpl.
22	360-4046	Center gear	Hohlrad
23	PN 1100-080	Screw M4x8	ZS-Schraube M4x8

10. Windshield XT / Windschutz XT 350-8517



Key-No.	Part-No.	Description	Bezeichnung
1	290-2035	Protective ring	Schutzring
2	290-4050	Guide	Führung
3	320-4004	Cover	Abdeckung
4	320-4008	Top panel	Deckel Windschutz
5	320-4012	Front panel	Frontscheibe
6	320-4015	Guide rail right	Gleitführung rechts
7	320-4016	Guide rail left	Gleitführung links
8	320-4017	Sliding ring	Gleitring
9	320-4018	Handle to lever	Griff zu Hebel
10	320-4019	Sliding block	Gleitstück
11	320-4020	Handle	Griff
12	320-4044	Pane fastener	Glashalter
13	320-7010	Side slide right compl.	Glas rechts kpl.
14	320-7028	Side slide left compl.	Glas links kpl.
15	320-7030	Lever left compl.	Hebel links kpl.
16	320-7031	Lever right compl.	Hebel rechts kpl.
17	320-7046	Back panel inside	Rückwand innen
18	320-7047	Back panel outside	Rückwand aussen
19	320-7048	Top slide compl.	Gläser oben kpl.
20	320-7058	Floor plate XT compl.	Bodenblech XT kpl.
21	320-7066	Floor panel	Windschutzboden
22	PN 1100-033	Screw M3x5	SK-Schraube M3x5
23	PN 1100-054	Screw KA30x8	ZK-Schraube KA30x8
24	PN 1100-143	Screw M4x12	ZK-Schraube M4x12
25	PN 1100-170	Screw M4x8	ZL-Schraube M4x8
26	PN 1100-187	Screw M4x12	SK-Schraube M4x12
27	PN 1100-189	Screw M3x5	EK-Schraube M3x5
28	PN 1300-038	Nut	Mutter

11. Windshield standard M / Windschutz standard M



Key-No.	Part-No.	Description	Bezeichnung
1	320-7149	Protective ring	Schutzring
2	320-4089	Windshield M	Windschutz M
3	360-3003	Latch	Schnapper

12. Calibration weights for 320-7140 / Kalibriergewichte für 320-7140

12.1 Group / Gruppe A2,A3

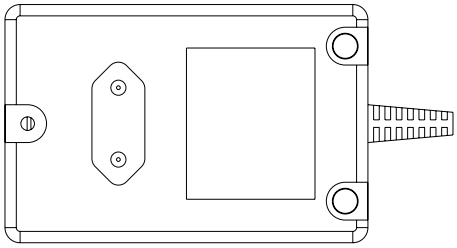
12.2 Group / Gruppe M1

12.3 Group / Gruppe M2,C2,C3,D1,D2

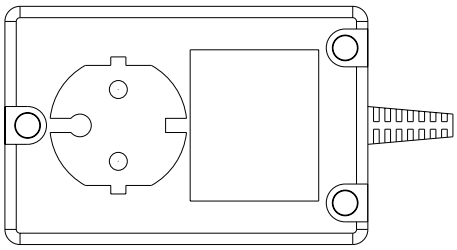
Key-No.	Part-No.	Description	Bezeichnung
1	320-3087	Calibration weight 60g	Kalibriergewicht 60g
2	320-3088	Calibration weight 100g	Kalibriergewicht 100g
3	320-3089	Calibration weight 220g	Kalibriergewicht 220g

13. Power supply / Netzadapter

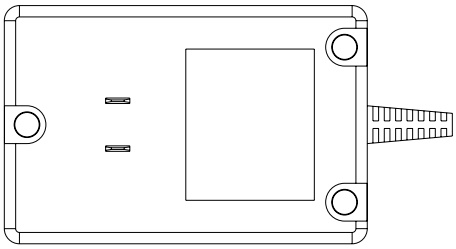
1



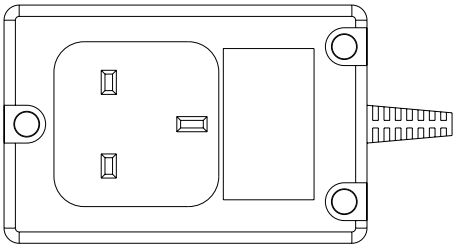
2



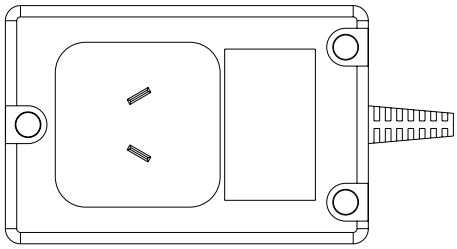
3



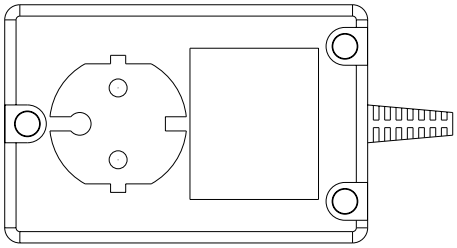
4



5



6



Key-No.	Part-No.	Description	Bezeichnung
1	350-8351	Power supply CH	Netzstecker CH
1	320-8024	Power supply CH IP65	Netzstecker CH IP65
2	350-8352	Power supply Schuko	Netzstecker Schuko
2	320-8025	Power supply Schuko IP65	Netzstecker Schuko IP65
3	350-8353	Power supply USA	Netzstecker USA
3	320-8026	Power supply USA IP65	Netzstecker USA IP65
4	350-8354	Power supply UK	Netzstecker UK
4	320-8027	Power supply UK IP65	Netzstecker UK IP65
5	350-8355	Power supply AUS	Netzstecker AUS
5	320-8028	Power supply AUS IP65	Netzstecker AUS IP65
6	350-8356	Power supply Schuko with ground	Netzstecker Schuko geerdet
6	320-8029	Power supply Schuko with ground IP65	Netzstecker Schuko geerdet IP65

Section B: Electronics / Kapitel B: Elektronik

1. Main board / Hauptprint 360-7200-020

1.1 Exchange of the main board 360-7200-020

The new basic version of the main board 360-7200-020 is applicable for balances series EP with software A0x-xxxx-xxx and for balances series ES with software B0x-xxxx-xxx.

The drawing below shows which hardware component is to be converted by an exchange of a main board.

After exchanging the main board, the EEPROM has to be reprogramed.

The schematics and bill of material are available on request.

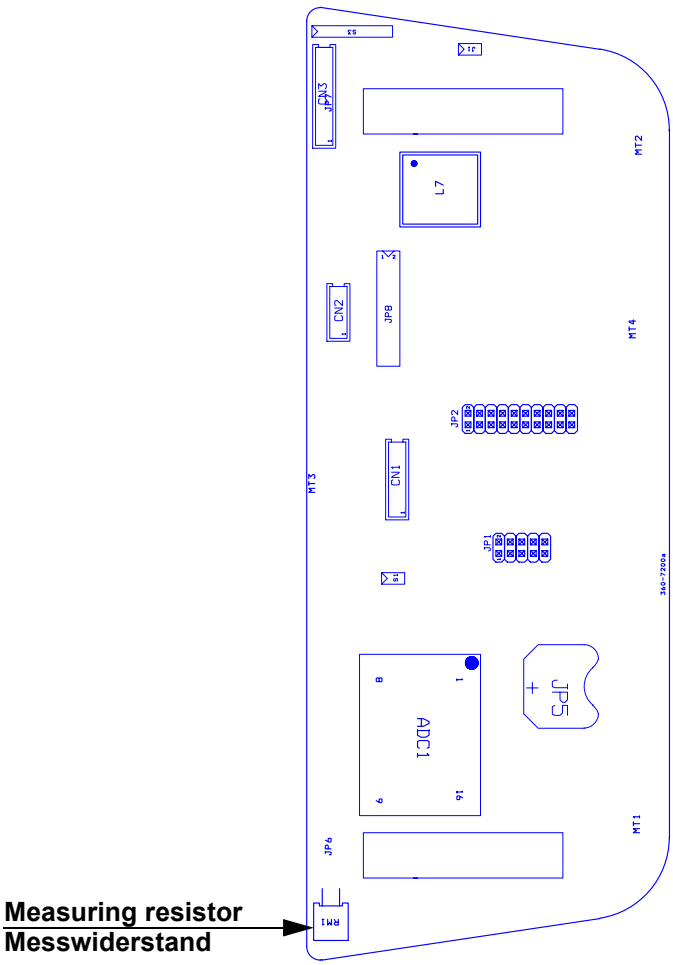
1.2 Austauschen des Hauptprintes 360-7200-020

Die Grundversion des Hauptprintes 360-7266-020 ist für Waagen der Serie EP mit der Software A0x-xxxx-xxx und der Serie ES mit der Software B0x-xxxx-xxx verwendbar.

Die markierte Komponente (siehe untere Darstellung) ist auf das Austauschboard zu übertragen.

Nach dem Austausch des Hauptprintes muss das EEPROM neu programmiert werden.

Die Schaltbilder und Stückliste stehen bei Bedarf zur Verfügung.

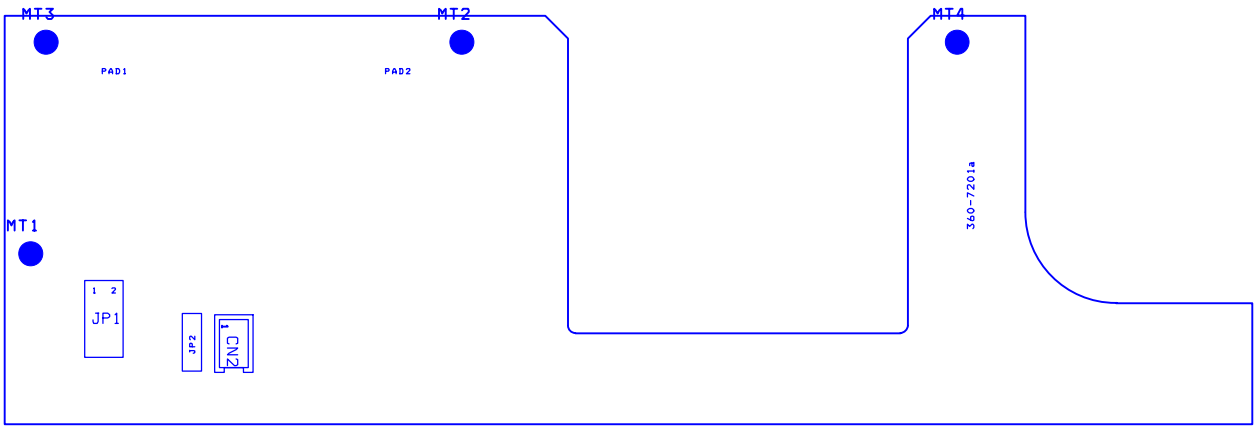


2. Connector board / Steckerprint 360-7201-010

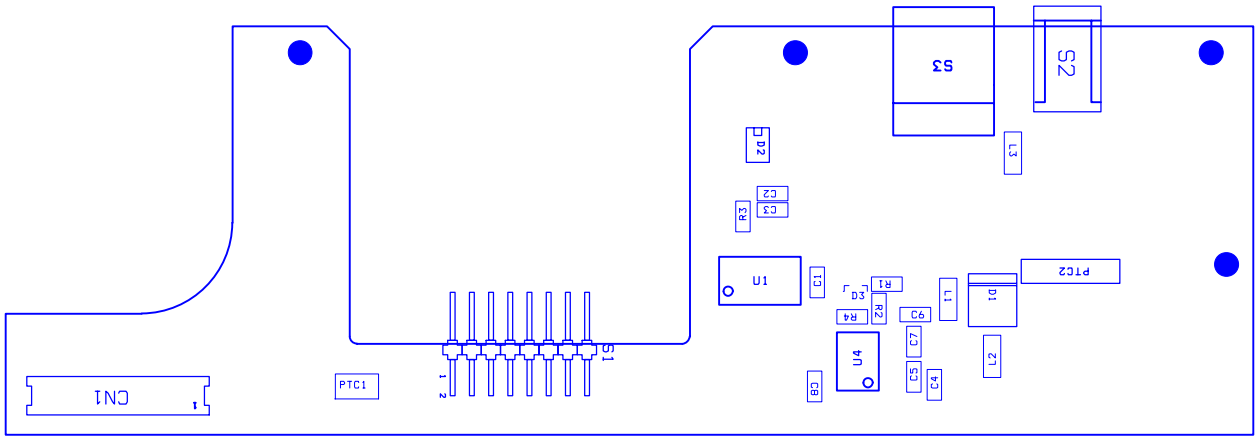
2.1 Assembly / Bestückung 360-7201-010

The schematics and bill of material are available on request.

Die Schaltbilder und Stückliste stehen bei Bedarf zur Verfügung.



Upper side / Oberseite

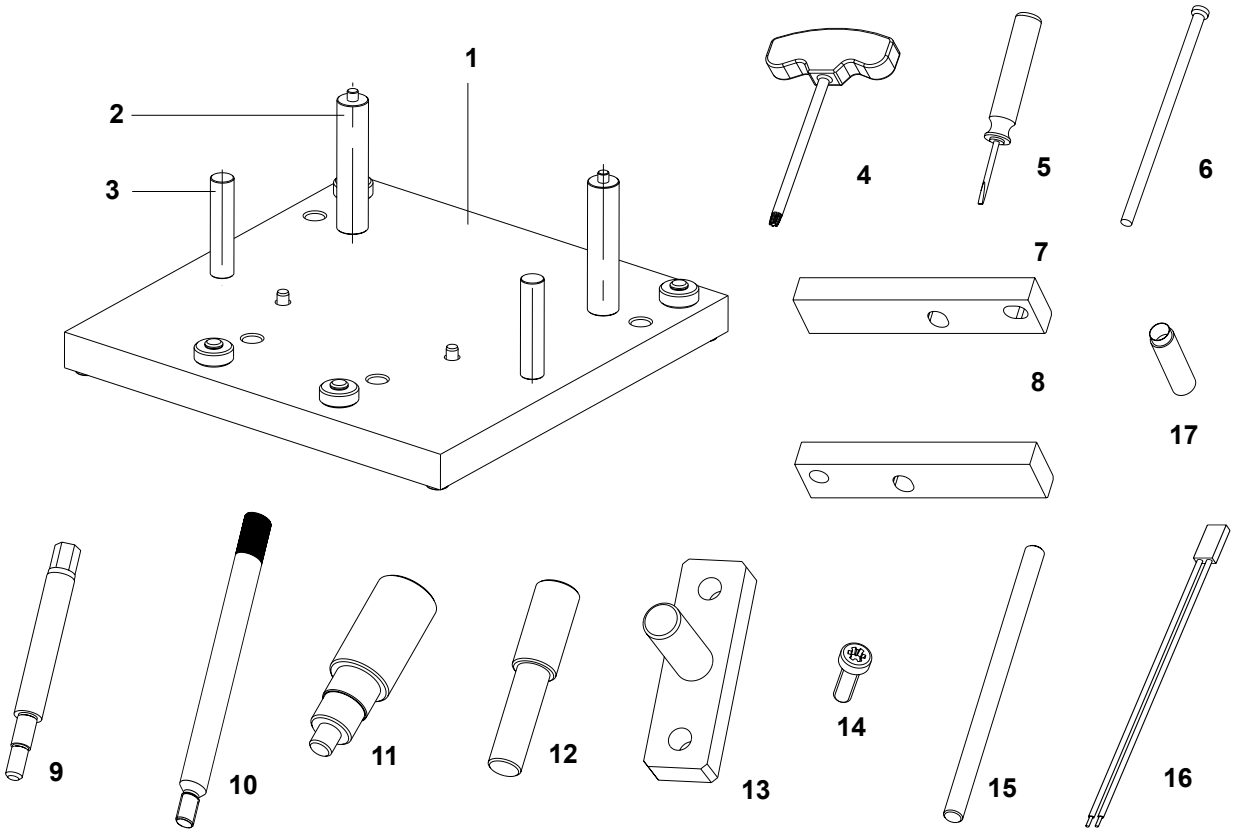


Lower side / Unterseite

Section C: Service

1. Service tools and equipment

1.1 Tool set *(350-8537)*



Position	Part-No.	Description	Quantity
1	W 41-1688	Mounting plate	1
2	W 41-1688-5	Support post, long	2
3	W 41-1688-6	Support post, short	2
4	350-6203	Line-head screwdriver M4	1
5	240-7124	Screwdriver, small, no.1	1
6	PW 29-43-300	Pin for flexure holder	2
7	W 41-1700	Assembly jig with slot	1
8	W 41-1701	Assembly jig with hole	1
9	W 41-1677	Assembly pin for assembly jig	4
10	W 41-1691	Centring spigot for flexures	2
11	W 41-1774	Centring spigot for 360 series only	1
12	W 41-1675	Centring spigot for 320, 330 series only	1
13	W 41-1674	Flexure sheet anchor	1
14	PN 1100-172	Line-head screw M4x12	2
15	W 41-1699	Alignment jig	1
16	W 41-1578-8	Connecting cable	1
17	W41-1681	Centring bush	1

1.2 Equipment

1.2.1 Implements

- Soldering iron
- Tweezers
- Lens
- Voltmeter

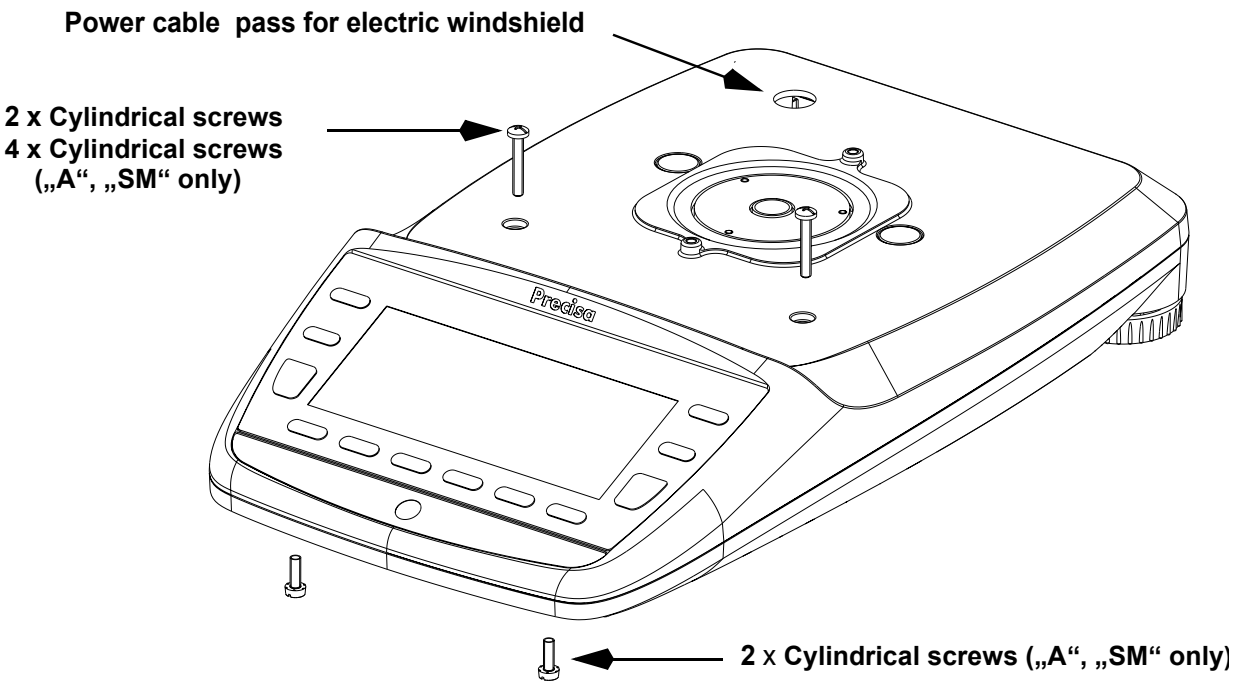
1.2.2 Standard tools

- Allen key size 2,5
-
- Box spanner size 4, 5.5 and 7
- Flat-bladed screwdriver size 1, 2 and 4
- Phillips screwdriver size 2

2. Opening up a balance

2.1 General procedure for opening up a Series 360 series balance

1. Disconnect the balance from the mains (Pull out mains plug)
2. Remove windshield, protective rings, weighing pan, pan holder
3. - Unscrew 2 cylindrical screws on the top of balance
   - Unscrew 4 cylindrical screws on top if model is „A“ analytical or „SM“
   - Unscrew 2 cylindrical screws on housing bottom if balancel model is „A“ analytical or „SM“ sermi micro.
4. Slightly raise the top of balance be carefull because key pad ribbon cable is connected to MPCB. Disconnect ribbon cable from MPCB plug. Remove now fully housing‘s top.


Power cable pass for electric windshield
2 x Cylindrical screws
4 x Cylindrical screws
(„A“, „SM“ only)
Precisa
2 x Cylindrical screws („A“, „SM“ only)

3. Introduction / Preparation of the tools

3.1 Introduction

In the event of a broken flexure, it is recommended that **all** are replaced.

NB: See page -----, repair set and page flexure sheet

The following assembly instructions provide information on how the flexures can be replaced most efficiently. It is important to employ a structured procedure for dismantling since it is essential to replace the **same parts** (particularly screws) **in the same place** when re-assembling.

The various items of the assembly instructions mean:

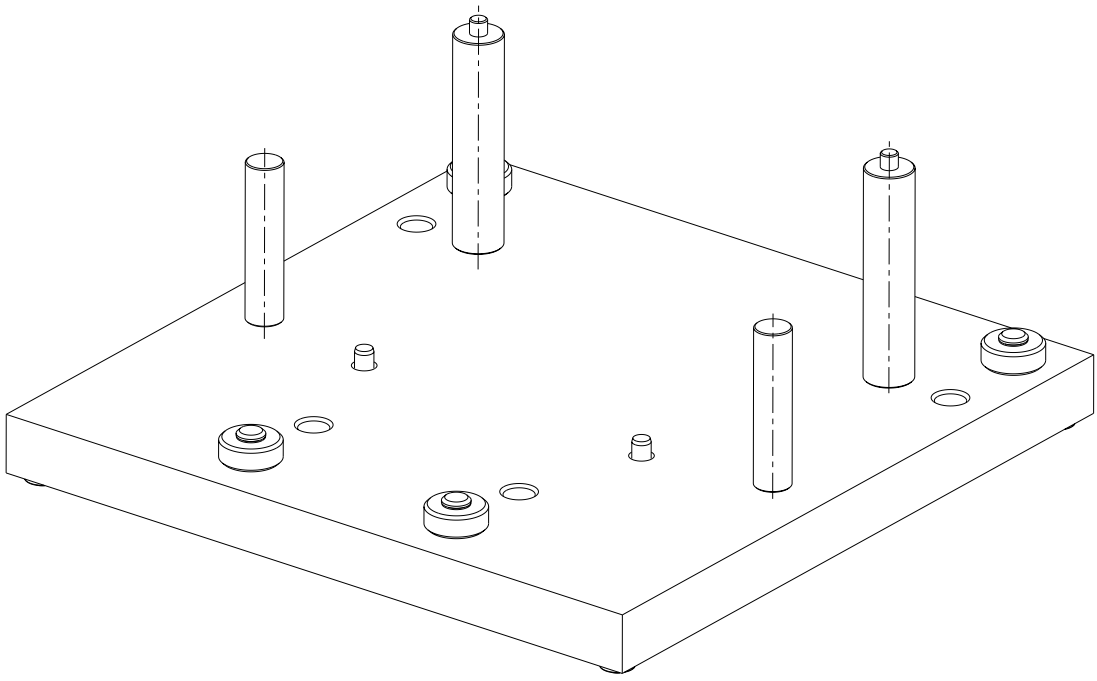
(26/B3): component items -> 26 key no. to identify the component, B3 page of service manual

[5]: tooling items see “Service tools and equipment” on page C2

3.2 Preparation of the tools

Before dismantling the balance it is necessary to carry out some preparation of the tools.

- Place the 2 long [2] and 2 short [3] support posts must be screwed into the correct places on the assembly plate
- The soldering iron should be plugged in or preheated

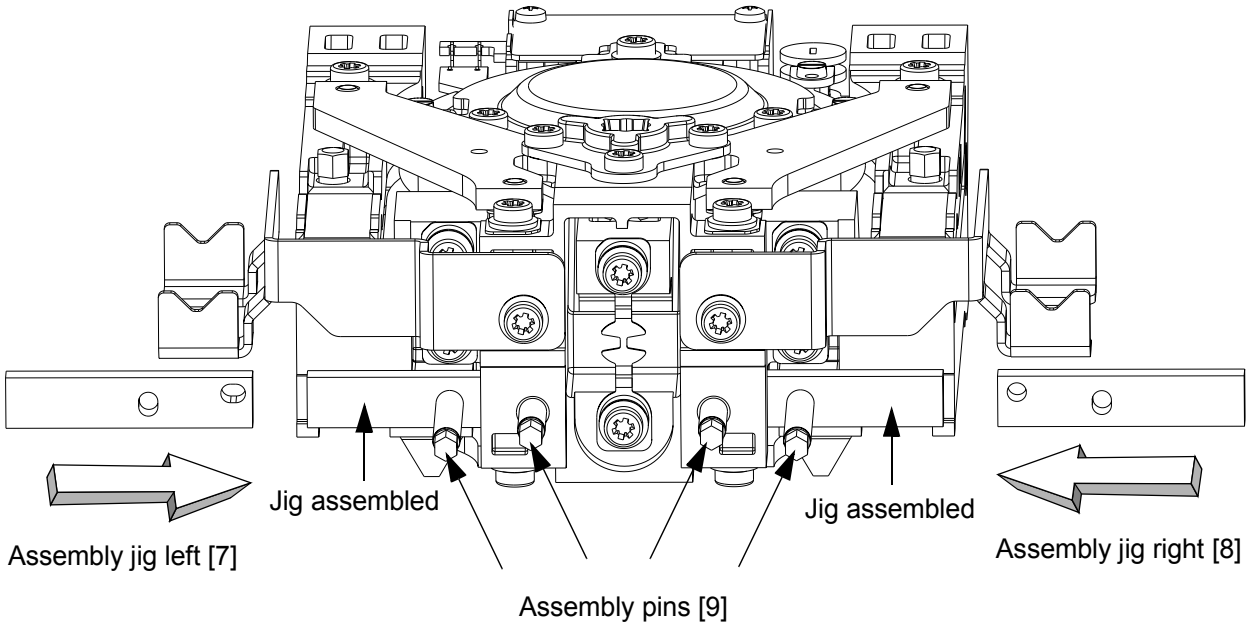


4. Dismantling the weighing cell

4.1 Removing the top of balance

• see “Opening up a balance” on page C4

Fig. 1



4.2 Removing the weighing cell from the bottom of balance

1. Loosen the the three screw nuts from balance bottom with box spanner size 7 to lift allow you then to remove the weighing cell from the balance bottom housing
2. Loosen the two allen screws, on both side of the mass counterholder and remove calibration weights
3. Loosen the display unit out of the clamp
4. Hold the weighing cell **only** on the chassis and lift it out of the bottom of balance
5. Placed on the assembly plate for easier handling
6. To protect the weigh cell, the two assembly jigs [7] + [8] are introduced in accordance with Fig. 1 and secured with the 4 assembly pins [9]

4.3 Removing the flexure-strap

1. Loosen the two screws (34/A8), remove flexure-strap (5/A8) incl. bases (10/A8) and spring washers (11/A8) (with the groups A only base (11/A8) mounted) → Do not separate screw components, assemble in same relationship
2. Screw the anchor [12] on tightly with 2 screws [13] in place of the flexure-strap

4.4 Removing the two flexure holders

1. Using the two pins for flexure holder [6] secure the upper flexure holder (4/A8) into the chassis
2. Unscrew the 4 screws (32/A8) of the upper flexure holder and remove together with the 4 spring washers or the 4 bases (11/A8) → 2 on the chassis, 2 on the support piece
3. Remove the two pins with the upper flexure holder incl. 4 spring washers and the flexure sheets, then take out the pins from the flexure holder
4. Secure the lower flexure holder into the chassis with the two pins for flexure holder [6]
5. Unscrew 4 screws (32/A8) from the lower flexure holder and remove together with the 4 spring washers or the 4 bases (11/A8) → 2 on the chassis, 2 on the support piece
6. Take out both pins with the lower flexure holder and remove the lower flexure holder together with the 4 spring washers and the flexure sheets

4.5 Removing the coil

1. Carefully unsolder 2 connecting wires (3/A8) from the Sensor mechanism (17/A20) using the tweezers
2. Unscrew 3 screws (31/A8) from the magnet cover (9/A8), remove the cover together with transport safety device (6/A8) and spring washer (37/A8)
3. Unscrew 2 brass screws (27/A8) from the coil on the balance arm (20/A8) using a No.2 screwdriver, remove the coil together with the washer
4. Carefully take out the coil from the pot

4.6 Removing the support piece

1. Unscrew 3 screws (36/A8) on the inner cone (17/A8) and remove inner cone
2. Unscrew upper screw (balance arm side) of the flexure sheet anchor [12] and pull off the support piece together with the flexure sheet anchor over the assembly pins [9]

4.7 Removing the balance arm

1. Unscrew brass screw (26/A8) from the stopper (2/A8), turn the stopper inwards ca. 90° and gently re-tighten the brass screw
2. Unscrew the 4 screws (33/A8) from the flexure sheets (7/A8) and remove both flexure sheets together with the bases (10/A8) and spring washers (11/A8) (with the groups A only base (11/A8) mounted)

Note: Since the lug of the sensor mechanism is firmly attached to the balance arm, the sensor mechanism must be unscrewed to dismantle the balance arm and gently tilted back:

3. Unscrew 3 screws (30/A8) of the sensor mechanism and gently tilt the sensor mechanism to the rear
4. Remove the two inner assembly pins [9] → unscrew from the balance arm
5. Remove the two outer assembly pins [9] → unscrew from the chassis
6. Remove the two assembly jigs [7] + [8]
7. Carefully tilt the balance arm over the pot and the sensor mechanism and take out
8. Further dismantling of the weighing cell is unnecessary

5. Installing the new „H-flexure sheets“

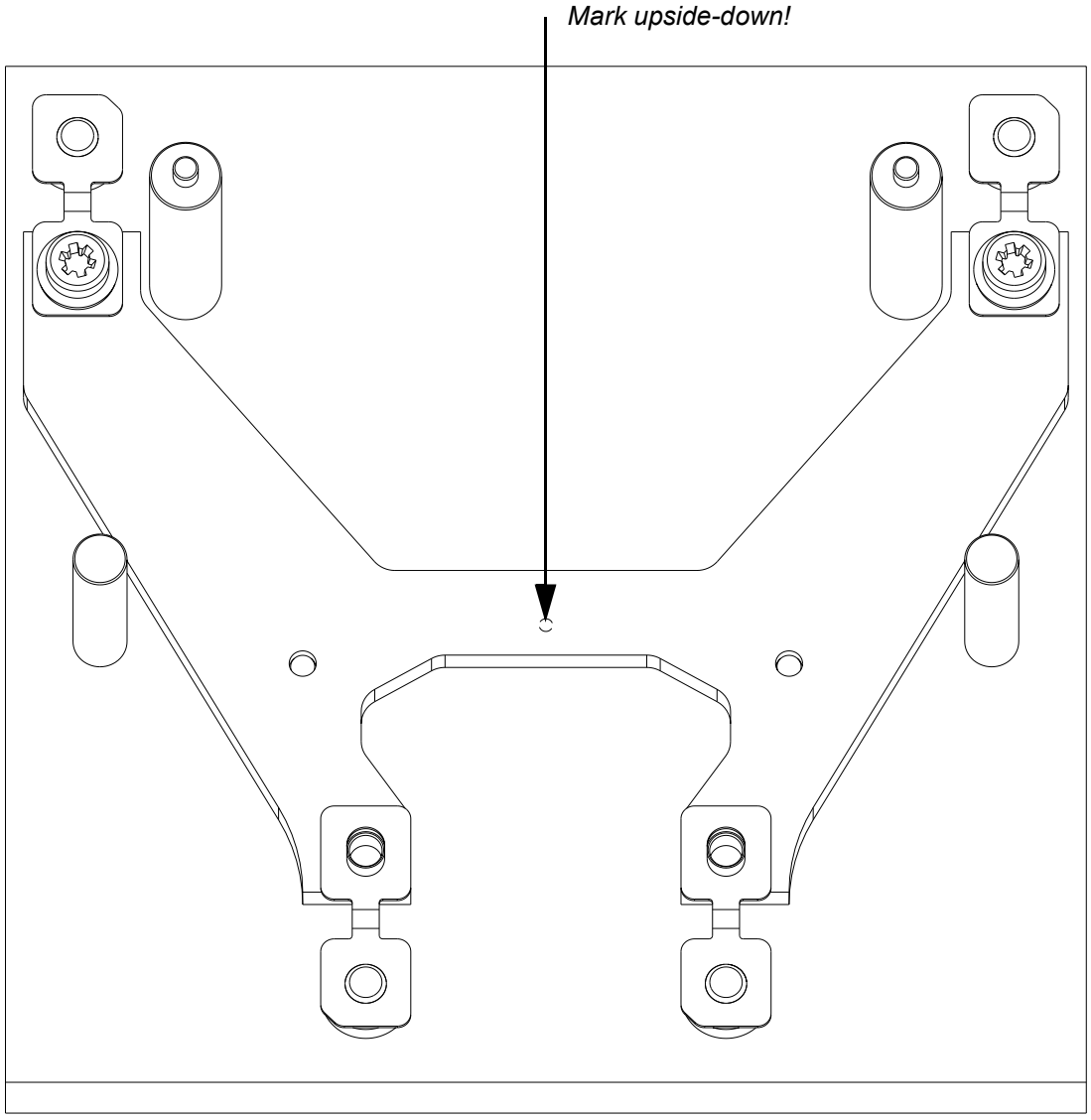
5.1 Removing the old „H-flexure sheets“

• Take out all screws from the flexure holder and remove the old „H-flexure sheets“ together with spring washers

5.2 Installing the new „H-flexure sheets“

1. Place a flexure holder on the assembly plate [1] as in Fig.2
2. Select 4 new „H-flexure sheets“ (8/A8) → Place the new „H-flexure sheets“ carefully on the assembly plate [1] as in Fig. 2 → the slot of the sheet is always on the flexure holder
3. Place 4 spring washers (11/A8) on the „H-flexure sheets“ and screw these tightly to the flexure holder with 4 screws (29/A8)
4. Take the complete flexure holder carefully off the assembly plate → Do not touch the „H-flexure sheets“! Prepare the second flexure holder in the same way

Fig. 2



6. Cleaning

6.1 Cleaning the pot

1. Cut strips of a double-sided adhesive tape (ca. 2x2 cm)
2. Wind the adhesive tape around one end of a toothpick
3. Introduce the toothpick, adhesive tape first, vertically into the annular gap
4. With circular movements move it repeatedly around the magnet. In this way any dirt particles stick to the adhesive tape
5. If necessary, repeat the procedure with a freshly prepared toothpick until the annular gap is free from impurities
6. Wipe over the top of the pot magnet with a piece of adhesive tape

6.2 Cleaning the coil

1. Using a lint-free cloth, remove any contamination from the coil
2. Do not clean the coil with adhesive tape; risk of injury

6.3 Final check of cleaning

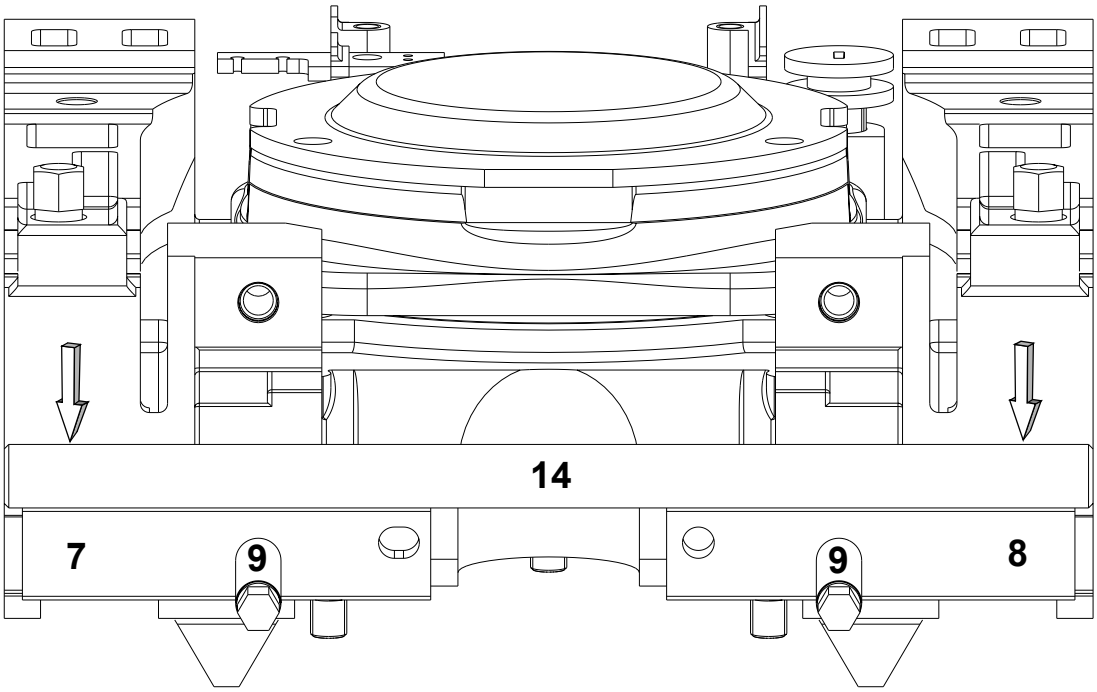
• Visually inspect the annular gap and the coil for any contamination and clean if necessary

7. Assembling the weighing cell

7.1 Assembling the balance arm

1. To facilitate the assembly, the chassis can be placed on the assembly plate → Attention to the sensor mechanism!
2. Pre-assemble assembly jigs [7] + [8] with 2 assembly pins [9] on the chassis as in Fig. 3
3. Adjust assembly jigs [7] + [8] using the alignment jig [14] horizontally in accordance with Fig.3 and tighten the two assembly pins [9] with box spanner, size 4

Fig. 3



4. Carefully introduce the balance arm (20/A8) over the pot and past it to the sensor mechanism
5. Assemble the balance arm with 2 assembly pins [9] loosely behind the assembly jigs. The balance arm must remain moveable
6. The right inner assembly pin of the assembly jig [8] can now be firmly tightened
7. The left inner assembly pin of the assembly jig [7] can now be firmly tightened
8. The balance arm is now fixed

7.2 Assembling the coil, the magnet cover and the transport safety device

1. Place the coil onto the balance arm and centre with the centring spigot [11]
2. Screw the coil tightly onto the balance arm with 2 brass screws (27/A8) and 2 washers
3. The coil must be centred in such a way that the centring spigot [11] can be removed smoothly

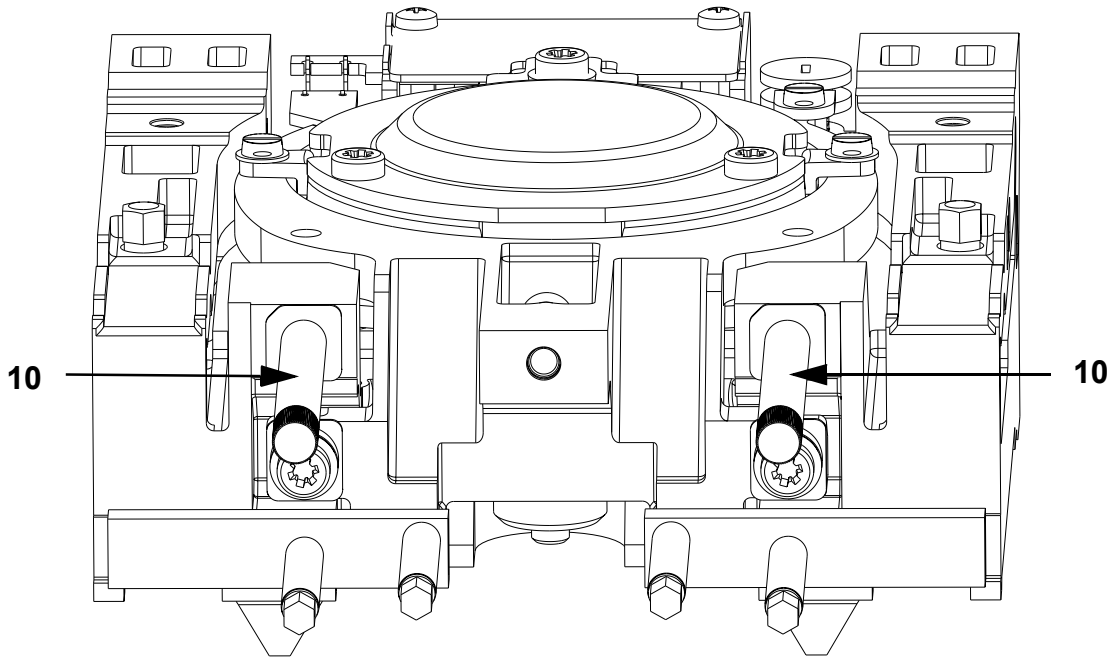
4. Pre-assemble the magnet cover with 2 screws → screws left and right
5. Pre-assemble the transport safety device (6/A8) with the third screw (31/A8) and spring washer (37/A8) → gently tighten, use line-haed screwdriver
6. Centring bush [16] shall be introduced between the balance arm-pilot and transportation safety dewice to assure constant annular grap. Tigten screw (31/A8) and remove centring bush.

7.3 Assembling the sensor mechanism and the stopper

1. Press the sensor mechanism carefully into the cutout in the chassis in the direction of the pot and secure to the chassis with 3 screws (30/A8)
2. Solder the two connection wires (3/A8) in parallel and strain-free to the sensor mechanism (24/A8)
3. Turn back the stopper (2/A8) with brass screw (26/A8) by 90° and screw tight
4. The stopper must be free of play and lie centrally in the symmetry screw (1/A8) → if necessary, re-adjust symmetry screw

7.4 Assembling new "V-flexure sheets"

Abb. 4

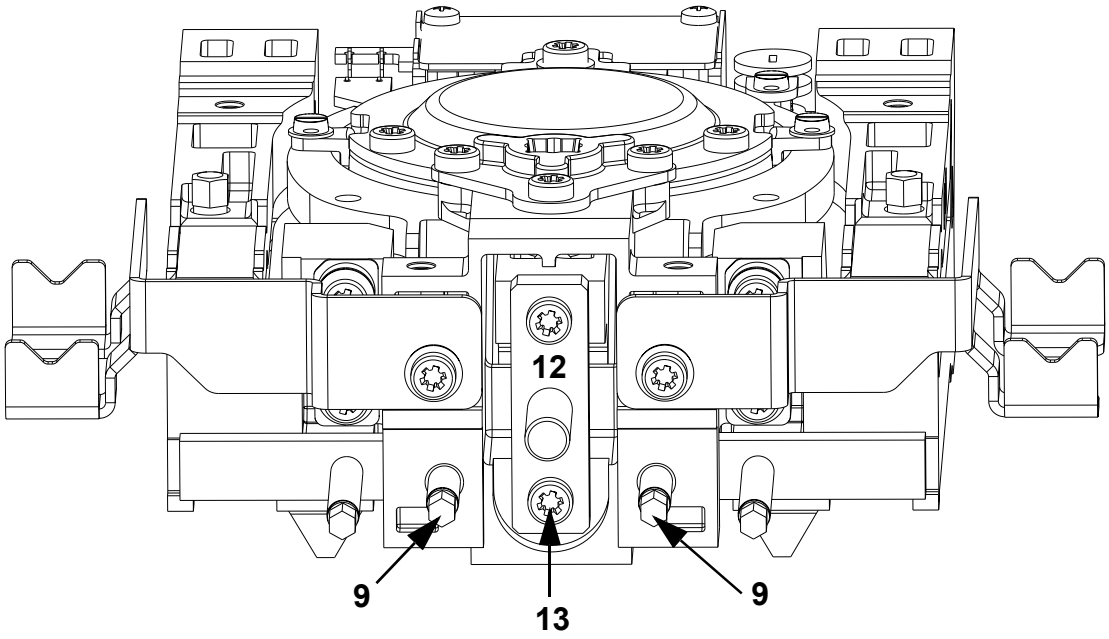


1. Select 2 new V-flexure sheets (7/A8) see "How to order spare parts / Anleitung zur Bestellung von Ersatzteilen" on page A2
2. Bring one „V-flexure sheet" into position as in Fig. 4 → slots are on the support piece side (below)
3. With a centring spigot [10], centre the „V-flexure sheet" in the hole on the chassis side (above)
4. With the second centring spigot [10], centre the „V-flexure sheet" in the slot on the support piece side (below)

5. With the line-head screwdriver tighten the first (upper) centring spigot and then remove the second (lower) centring spigot, without touching the „V-flexure sheet“ in doing so
6. Fasten the „V-flexure sheet“ on the balance arm side with base (10/A8), spring washer (11/A8) and screw (33/A8), or with groups A with base (11/A8) and screws (33/A8) fixate → Fig. 4
7. Remove the second (upper) centring spigot and fasten the „V-flexure sheet“ on the chassis side with base (10/A8), spring washer (11/A8) and screw (33/A8), or with groups A with base (11/A8) and screws (33/A8) fixate

7.5 Assembling the support piece and inner cone

Fig.5



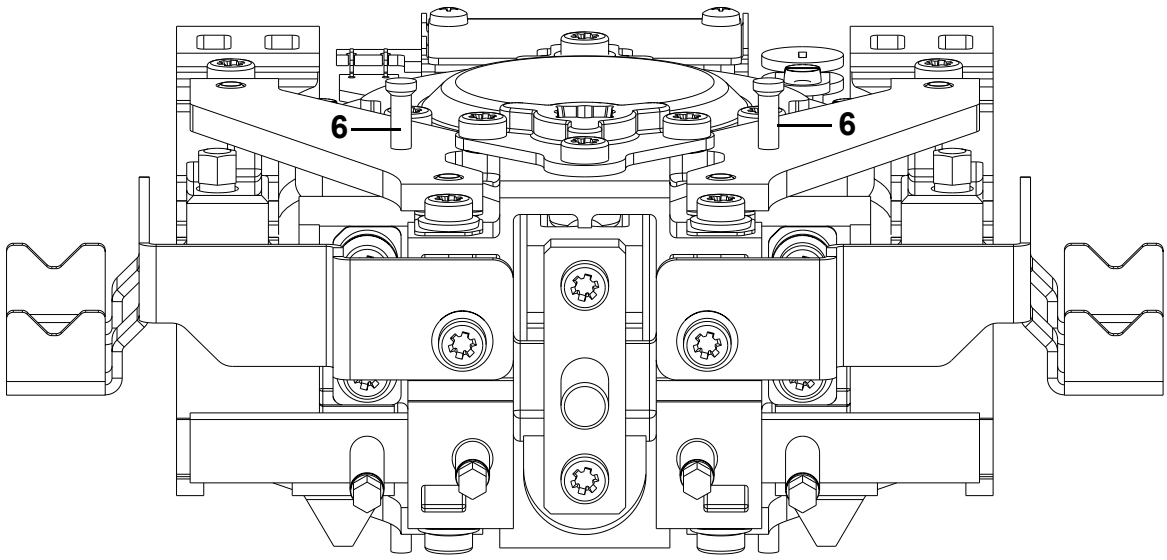
1. Introduce the pre-assemble support piece over the two inner assembly posts [9] → Fig. 5
2. It must be possible to push the support piece smoothly over the two inner assembly pins. In case the support piece can not pushed smooth-running over the two assembly pins, unscrew pin [9] and tighten it again after.
3. Locate the support piece and the balance arm using the flexure sprap anchor [12] and the two screws [13] → Fig. 5
4. The support piece and balance arm are now fixed.
5. Assemble the inner cone (17/A8) to the support piece with 3 screws (36/A8)

7.6 Assembling the flexure holders

1. Introduce the two pins for flexure holder [6] in the first pre-assembled flexure holder (→ see “Installing the new „H-flexure sheets“” on page C9) in such a way that the shoulder of the pins is opposite the screw heads on the flexure holder
2. Bring the two pins with the flexure holder into position in the chassis → Fig. 5

3. Lower the flexure holder carefully over the two pins on the chassis, until the flexure sheets just touches the chassis and the support piece
4. Secure the flexure holder with 4 screws (32/A8) uand 4 spring washers (11/A8)
5. Push through the two pins up to the installed flexure holder
6. On the opposite side introduce the second pre-assembled flexure holder (→ see “Installing the new „H-flexure sheets“” on page C9) with the screw heads inwards over the two pins and lower onto the chassis, until the flexure sheets just touches the chassis and the support piece
7. Secure the flexure holder with 4 screws (32/A8) and 4 spring washers or the 4 bases (11/A8)
8. The two pins must be capable of being withdrawn smoothly from the flexure holder

Fig. 6

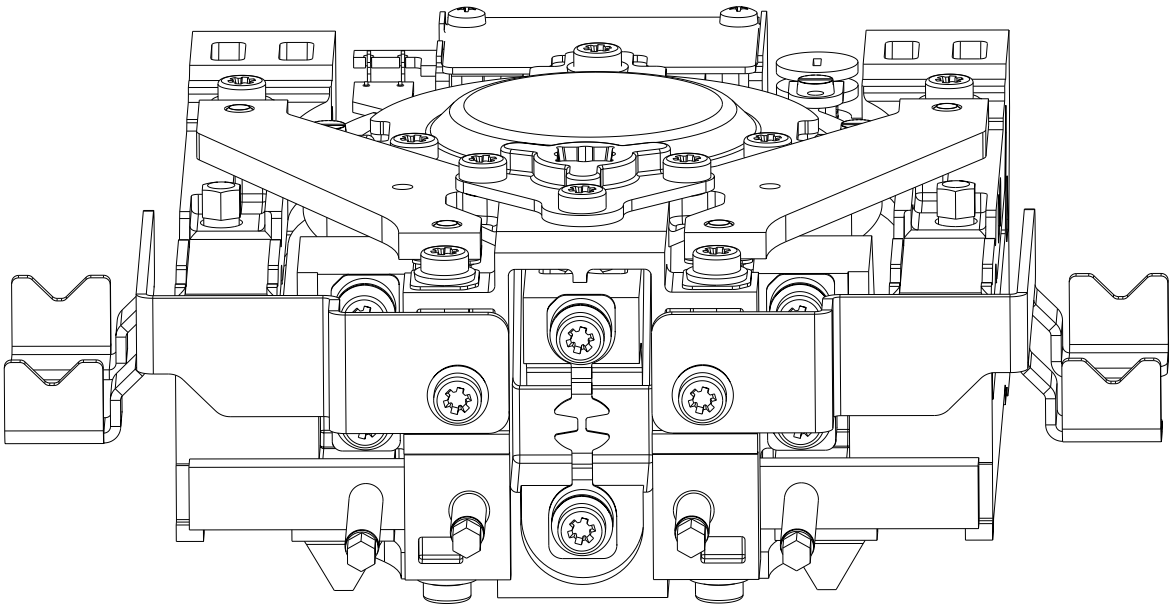


7.7 Assembling the new „flexure-strap“

1. Select a new „flexure-strap“ (5/A8) see “How to order spare parts / Anleitung zur Bestellung von Ersatzteilen” on page A2
2. Unscrew 2 screws [13] on the anchor [12] and remove it
3. Bring the „flexure-strap“ into position as shown in Fig.7 → the slot is on the support piece side
4. Using a centring spigot [10], centre the „flexure-strap“ in the hole on the balance arm side
5. With the second centring spigot [10] centre the „flexure-strap“ in the slot on the support piece side
6. Tighten the first (upper) centring spigot and then carefully remove the second (lower) centring spigot, without touching the „flexure-strap“ in doing so
7. Fasten the „flexure-strap“ on the support piece side with base (10/A8), spring washer (11/A8) and screw (34/A8), or with groups A with base (11/A8) and screws (33/A8) fixate → Fig. 7

8. Remove the second (upper) centring spigot and fasten the „flexure-strap“ on the balance arm side with base (10/A8), spring washer (11/A8) and screw (34/A8), or with groups A with base (11/A8) and screws (34/A8) fixate

Fig. 7



7.8 Dismantling the assembly jigs

1. Unscrew and remove the two inner assembly pins [9] on the support piece
2. Unscrew and remove the two outer assembly pins [9] on the suport piece
3. Take out the two assembly jigs [7] + [8] from the side
4. If the two assembly pins [6] on the flexure holder (4/A8) are still assembled, remove them carefully

7.9 Installing the weighing cell in the bottom of balance

1. Carry out a further movement check on the balance arm → the balance arm must not touch the transport safety device (6/A8). Visual check with the lens
2. Place the weighing cell carefully in the bottom of balance → hold the weighing cell only to the chassis
3. Tilt the bottom of balance to the side and screw the weighing cell securely from below with 3 nuts
4. Carefully connect the sensor mechanism (24/A8) plug to the main board (8/A4)
5. The balance is now ready for the adjustments on the following pages
6. Insert the calibration weights and mount the counterholder with two allen screws per side, using box spanner, size 2.5

Section D: Adjustments

1. Adjustments

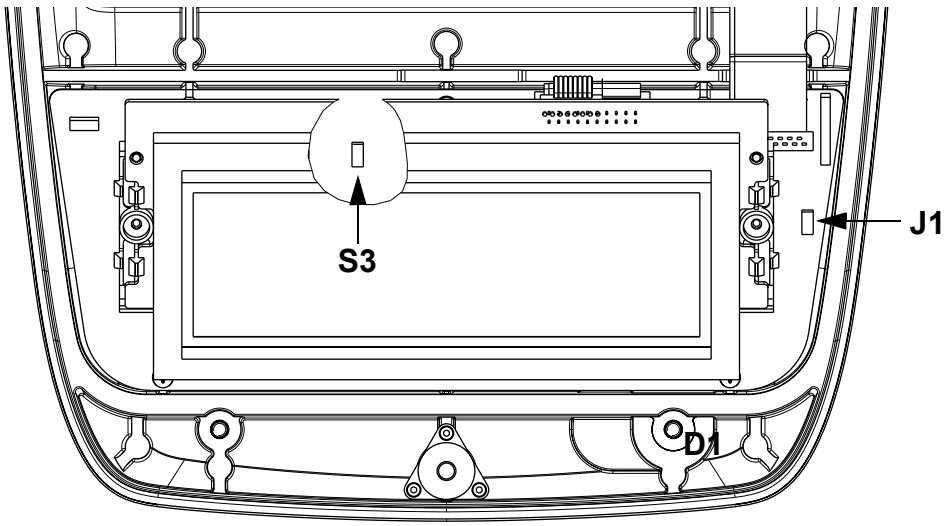
1.1 Activation of the service mode ES and EP

Good to know: Setting the balance into service & maintanance mode is necessary to achieve several other adjustements which will be required along the following items.

1.2 Set the open balance to the service mode ES or EP

1. Balance is disocnnected from mains.
2. Level the balance with the levelling feet, rear of the balance.
3. Remove the jumper (J1) on right side of the display, fig. 1.
4. Connect the balance to the mains, balance is switching on automaticly.
5. - On **ES** model press «**CHANGE**» to enter in the service & maintenance program of the balance. If access code is required then enter „5236“
   - On **EP** model press «**MENU**» to enter in the service & maintenance program of the balance. Later on, depending on the item you are you need to select one of the three maintenance programs listed. If access code is required then enter „5236“
   - You see SERVICE MODE status confirmed on display top.
6. **NB:** Do not forget to reinstall jumper after service & maintenance work is terminated.
   NB II: Also the unit letter „g“ for gram remains frozen and proves easily that you are working in „SERVICE MODE“.

fig. 1



1.3 Adjusting of the symmetry ES and EP

1. Connect the connecting cable [16/C2] from tool set see “Tool set (350-8537)” on page C2 to plug S3 on the MPCB (see fig. 1).
   NB: For better access disconnect display board from holder, one side only, opposite side will releasing easily.
2. Connect the voltmeter, set it to „DC“ measurement, to the connecting cable [16/C2].
3. The voltmeter must show approximately the **same voltage** in both end positions. Lifted up and pressed down position of the balance arm. Same voltage, meant is closed figure like (fictitious value) ~+ 2,43 and ~-2,35 (one positive, one negative).
4. If the difference is too great, the extremity position of the balance arm needs to be adjusted with the symmetry screw [1/A8].
5. Once adjusted detach connecting cable and voltmeter from the balance.

1.4 Checking the pre-load ES and EP

1. The pre-load error ERROR 60 (below minimal converter range) must not appear when the service weighing pan is in position **without load**.
2. The pre-load error ERROR 61 (above maximal converter range) must not appear when the service weighing pan is in position with **full load**.
3. If an ERROR is displayed:
   - the symmetry must be re-adjusted
   - and the transport safety device adjusted and checked if friction is caused
   - general check of the complete weighing cell.

1.5 Checking the lowering process of the calibration weight ES

1. The balance must be in service mode → see “Set the open balance to the service mode ES or EP” on page D2.
2. The ribbon cable from the membrane keyboard must be connected to the MPCB (8/A4) and connect the balance then to mains.
3. Press and hold down «**CHANGE**» until „TESTPROG 1“ appears on Info-Display, release then the key.
4. The calibration weight is actuated with the two **{SOFTKEY}** „AUF“ (UP) and „AB“ (DOWN), actuation by the **{SOFTKEY}** below the corresponding description.
5. Check the lowering and ascending process by pressing one of the **{SOFTKEY}** . The calibration weight must run cleanly into the outer carrier of the weighing cell → carry out a full re-alignment of the calibration unit in the housing‘s bottom.

1.6 Checking the lowering process of the calibration weight EP

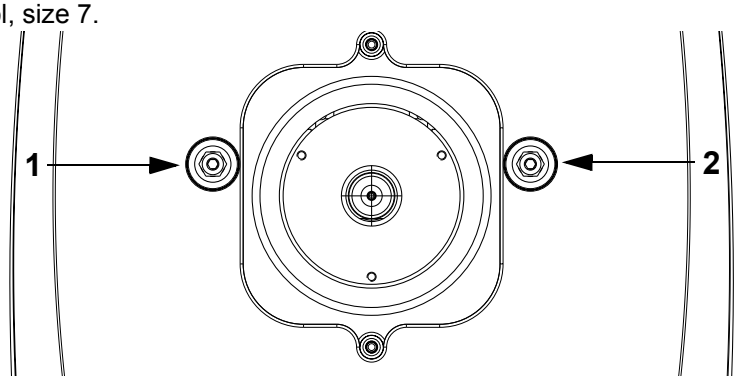
1. The balance must be in service mode → see “Set the open balance to the service mode ES or EP” on page D2.
2. The ribbon cable from the membrane keyboard must be connected to the MPCB (8/A4) and connect then the balance to mains.
3. Press «**MENU**»

   NB: Now you need to work with the **{SOFTKEY}** , the **{SOFTKEY}** are on the keypad‘s bottom line. The function of them is guided by the short description information on the display bottom.
4. Select „Test program“ with the arrow **{SOFTKEY}** then confirm with „enter“ on display bottom line with corresponding **{SOFTKEY}** .
5. The calibration weight is actuated with the two **{SOFTKEY}** „Up“ and „Down“.
6. Check the lowering and ascending process by pressing one of the **{SOFTKEY}** „Up“ or „Down“. The calibration weight must run cleanly into the outer carrier of the weighing cell → carry out a full re-alignment of the calibration unit in the housing‘s bottom.

1.7 Adjusting the corner load

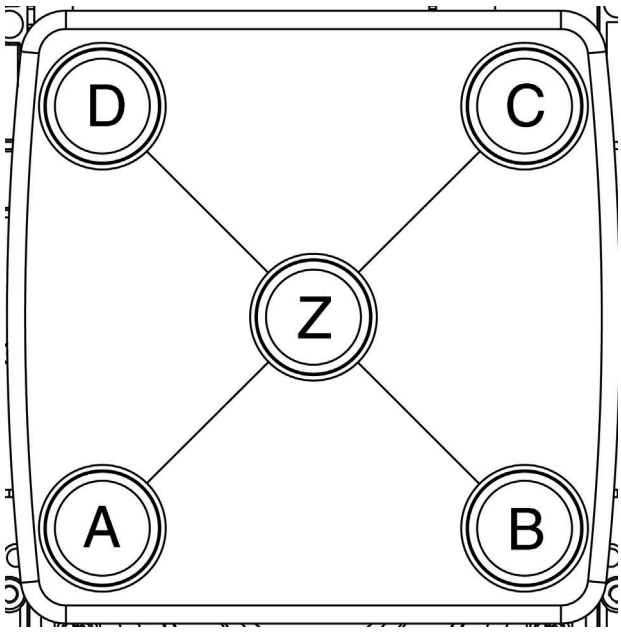
1.7.1 For models with accuracy 1 g, 0,1 g, 0,01 g, 0,001 g

1. Before you reassamble housing top push out from inside both blind plugs (9/A6) to assure access to corner adjustment screws.
2. The ribbon cable from the membrane keyboard must be connected to the MPCB (8/A4)
3. Draw the top-housing carefully on the housing‘s bottom and tighten with the corresponding screws.
4. Place the weighing pan on the balance and connect the balance to mains.
5. Tare the balance with «**TARE**» 0/T 0/T
6. Check with a test weight for corner load → see “Final check” on page H9 the difference between the two diagonals A-C and B-D → see “Example of corner load adjustment:” on page D5. The diagonal with the **larger absolute deviation** should be adjusted first.
7. For corner load tolerances see “Final check” on page H9
8. Adjustment of the corner load is effected by turning the differential set screw (1) and (2) with „box spanner“ tool, size 7.

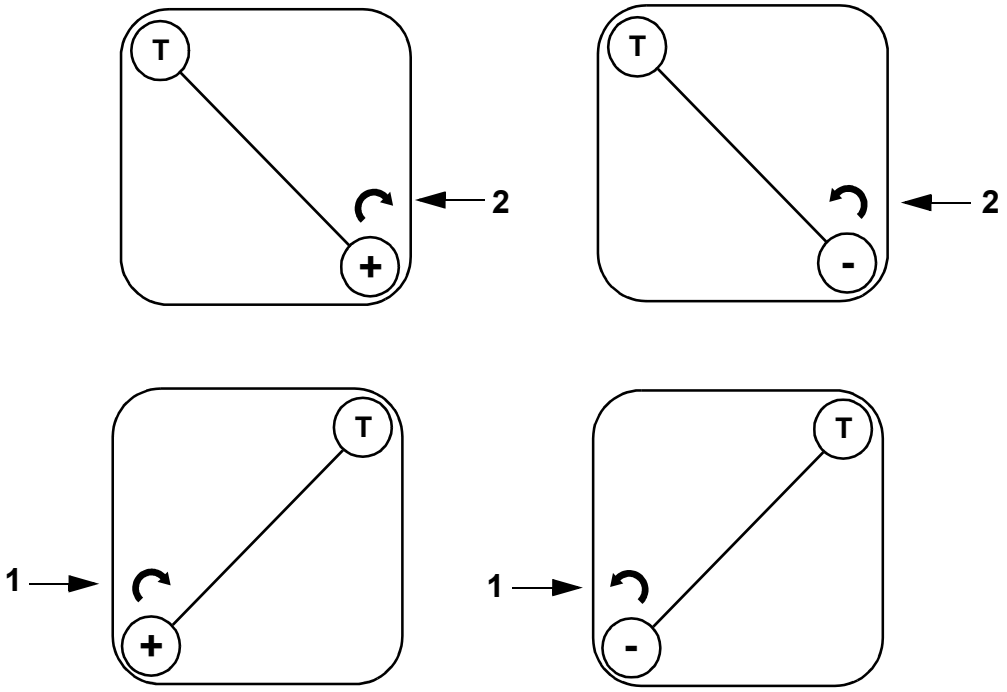


9. When corner are in tolerance as per see “Final check” on page H9 put blind plug back.

1.7.2 Example of corner load adjustment:



1. The diagonal A-C has the larger difference.
2. Place a test weight at point C of the weighing pan. Tare the balance using «**TARE**» 0/T 0/T
3. Move the weight to point A.
4. There is a difference of 12 digits between points A and C (A=12, C=Tare=0).
5. The displayed value for point A is reduced by turning the corner load screw 1 above point A in an anti-clockwise direction → the difference between A-C becomes smaller.
6. There is a difference of 7 digits between points B and D (B=-7, D=Tare=0).
7. The displayed value for point B is reduced by turning the corner load screw 2 above point B in a clockwise direction → the difference between B-D becomes smaller.
8. The diagonals A-C and B-D should be repeatedly adjusted until the two diagonals have reached the permitted tolerances for corner load → see “Final check” on page H9.
9. Place a test weight on point Z of the weighing pan, tare balance using «**TARE**» 0/T 0/T .
10. Check the points A-B-C-D against the permitted tolerances and correct if necessary.



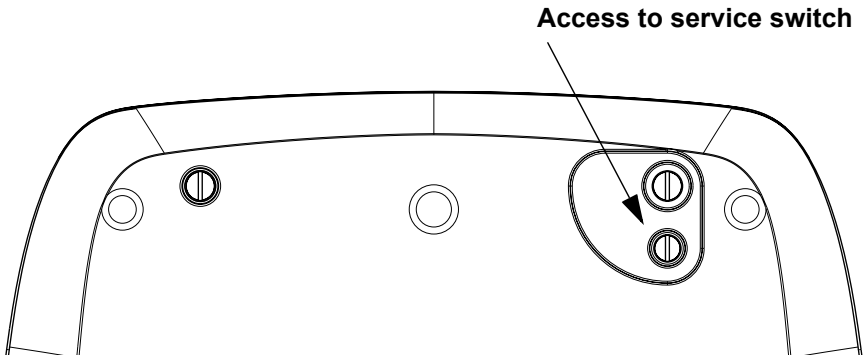
1.8 Final check of corner load

1. The balance must have reached operating temperature.
2. Check the corner load tolerance → see “Final check” on page H9.
3. Insert again the two blind plugs (9/A6) when corners are in tolerance.

1.9 Set the closed balance to the service mode ES or EP

1. Service switch is positioned below housing bottom, right side, protected by a slotted screw, see fig. 2. To acceed unscrew slotted screw, see fig. 2 and press gently with the small screw driver from the tool set or with a bended up „paper clip“ on the service switch.

Fig. 2



1.9.1 Set the closed balance into service mode, ES only

1. Push the CHANGE-key „CODE 0“ appears in the display.
2. Press «**ENTER**» „CODE 0000“ appears in the display.
3. With the „arrow- **{SOFTKEY}** on the key pad bottom, insert the code „5236“ and confirm with «**ENTER**»
4. Balance is now in service mode.

1.9.2 Set the closed balance into the service mode, EP only

1. SERVICE is written on the top of the disply as confirmation that you are in the service & maintenance program of the balance.
2. Push «**MENU**» .
3. Select one of the three maintenance programs you need to work with.

1.10 Linearisation of the balance

1. The balance must have reached operating temperature and be in service mode → see “Set the closed balance to the service mode ES or EP” on page D6.
2. Have weights of 1/2 full load and full load ready → see “Final check” on page H9.
3. - For ES: Press and hold «**CHANGE**» until "LINEARITY" appears on the info-display and then release the key.
   - For EP: Select service program linearisation with the arrows **{SOFTKEY}** and confirm with enter **{SOFTKEY}**
4. ES and EP show on display bottom, in correspondence with the key pad line the three linearisation weights in „g“ which correspond, to the balance empty pan no load, to 1/2 weight capacity and to 1/1 full balance capacity. A fictitious example: „0“,“300“ „600“ and the last key to confirm the established linearisation points, confirm with SET with the **{SOFTKEY}** below the SET writing, on ES model. On EP with the **{SOFTKEY}** below the „ENTER“ writing on display bottom.

1.11 Adjustment of the internal calibration weight

1. The balance must have reached its operating temperature
2. Disconnect the balance from the power supply and reconnect, allow the balance to restart normally
3. Push the service switch

NOTE: The jumper J1 must be in place!

4. Have weight of 100g ready.
5. Press and hold down the T-key until "CALIBRATION" appears on the Info-Display, then release
6. The process of internal calibration weight adjustment will be initialised "INTERNAL CALIBRATION" will appear on the Info-Display and the balance will show "INT"
7. "EXTERNAL CALIBRATION" will appear on the Info-Display and the balance will first show "0000"
8. If the balance displays, "100", it requires a weight of this value
9. Place a weight of 100g in the centre of the weighing pan, the balance will flash
10. If the balance again shows "0000", remove the weight from the weighing pan
11. The balance terminates the external calibration and "INTERNAL CALIBRATION" will again appear on the Info-Display and the process will automatically terminate
12. The balance is switched off and on again and service mode is abandoned

1.12 Final check of the adjustment

1. The balance must have reached its operating temperature, for that assure that balance is connected at least three hours to the mains.
2. Calibrate the balance by holding «**TARE**» till „CALIBRATION“ appears → release the key.
3. Check the corner load → see “Adjusting the corner load” on page D4.
4. Check the linearity with half weight and full weight.
5. Carry out any S-corrections if necessary for evaluation see “S-correction of a balance” on page D8.

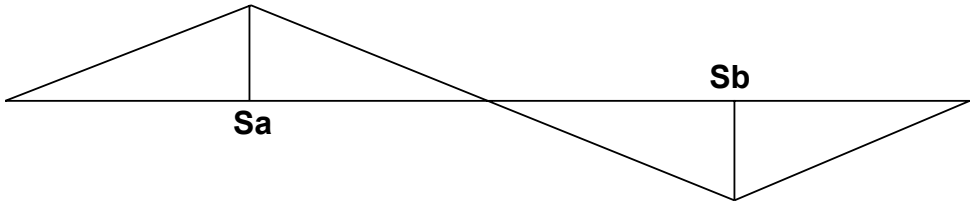
1.13 S-correction of a balance

1.13.1 General notes on S-correction

- The balance must have reached its operating temperature and must be in service mode.
- In every linearisation of a balance the correction factor is deleted and must, if necessary, be redefined.

1.13.2 Measuring the S-correction ES and EP

1. Place a weight of 1/4 full load in the centre of the weighing pan, note the difference between the actual weight and the weight indicated by the balance.
2. Place a weight of 3/4 full load in the centre of the weighing pan, note the difference between the actual weight and the weight indicated by the balance.



1.13.3 Calculating the correction factor

- For the correction factor the sign of the measured value must be reversed.
- for example: + 4 digits were measured →- 4 digits must be entered.
- for example: - 2 digits were measured →+ 2 digits must be entered.

1.13.4 Entry of the correction factor for ES model

1. Press and hold down the CHANGE-key until "SCORRECTION" appears on the Info-Display, then release the key.
2. By pressing the arrow left or right select section A or B
3. To change the section values press arrow keys "UP" or "DOWN" the values setted are safed as soon you quit the correction menu with the „esc“ **{SOFTKEY}** you see the S-correction modification.
4. Submit the balance to a further final check → see “Final check of the adjustment” on page D7.

1.13.5 Entry of the correction factor for EP model

1. Select service program S-correction with the arrows **{SOFTKEY}** and confirm with enter **{SOFTKEY}**
2. On display bottom you find the denominated S-correction areas corresponding to the **{SOFTKEY}**.
   NB: On the display lower side on left corner over the „esc“ writing you can read the changing of S-correction values you are implementing.
3. Confirm all changes with **{SOFTKEY}** „enter“

2. Final check

Balance ES as EP	Weighing range (g)	Reada-bility	Reprodu-cibility (+ / -)	Linearity Weight (g)	Linearity Tolerance (+ / -)	Corner load Weight (g)	Corner load Tolerance (+ / -)
125 SM	125	0.01 mg	0.03 mg	2 x 50	0.06 mg	50	0.1 mg
225 SM-DR	225	0.01 mg / 0.1 mg	0.01 mg / 0.1 mg	2 x 100	0.2 mg 0,06 mg	100	0.5 mg
120A	120	0.1 mg	0.1 mg	2 x 100	0.2 mg	50	0.2 mg
220A	220	0.1 mg	0.1 mg	2 x 100	0.2 mg	100	0.2 mg
320A	320	0.1 mg	0.15 mg	1x 50 1x 100 1x 200	0.2 mg	100	0.2 mg
420A	420	0.1 mg	0.15	2x 200	0.4 mg	100	0.2 mg
520A	520	0.1 mg	0.15	1x 50 1x 100 2x 200	0.4 mg	200	0.2 mg
420A-FR	120 - 420	0.1 - 0.01	0.15 / 1mg	2x 200	0.3 / 1 mg	100	0.2 mg
320M	320	1 mg	1 mg	2 x 150	1.5 mg	100	2 mg
620M	620	1 mg	1 mg	2 x 300	1.5 mg	200	2 mg
920M	920	1 mg	1 mg	1x 50 1x 400 1x 500	1.5 mg	200	2 mg
1220M	1220	1 mg	1 mg	2x 100 1x 1000	2 mg	400	2 mg
2220M	2220	1 mg	1 mg	2x 100 2x 1000	2 mg	500	2 mg
620M-FR	120 - 620	1 / 10 mg	1 / 10 mg	2x 300	1.5 mg	200	2 mg
1220M-FR	240 - 1220	1 / 10 mg	1 / 10 mg	2x100 2x 1000	1.5 / 10 mg	400	2 mg
1200C	1200	10 mg	10 mg	2 x 600	10 mg	400	20 mg
2200C	2200	10 mg	10 mg	2 x 100 2x 1000	15 mg	1000	20 mg
4200C	4200 g	10 mg	10 mg	2 x 100 2x 2000	15 mg	2000	20 mg
6200C	6200 g	10 mg	10 mg	2 x 3000	15 mg	2000	20 mg
6200C-FR	6200 2200	0.1 0.01	0.1 0.01g	2 x 3000	0.1 g 0.015 g	2000	30 mg
8200C-FR	8200 3200	0.1 0.01	0.1 0.01	2 x 100 2x 4000	0.1 g 0.015 g	4000	30 mg
6200 D	6200 g	0.1 g	0.1 g	2 x 3000	0.1 g	2000	0.2 g
8200D	8200 g	0.1 g	0.1 g	2 x 4000	0.15 g	3000	0.2 g
12200D	12200 g	0.1 g	0.1 g	2x 100 2x 6000	0.15 g	4000	1 g
12200G	12200 g	1 g	0.5 g	2x 100 2x 6000	0.15 g	4000	1 g

3. Error messages

3.1 Operating error

(Error disappears with correct use or application)

ERROR-No.	ERROR responsibility	ERROR repair
ERROR 1	invalid program	load right program
ERROR 2	value out of range density-program	use right weight
ERROR 3	weight too small	use higher weight
ERROR 4	wrong anti-theft-code	use right code
ERROR 5	wrong anti-theft-code	use right code
ERROR 8	zero point outside range	call service
ERROR 9 / 0	calibration factor bad	repeat calibration
ERROR 9 / 1	zero point difference too high	repeat calibration
ERROR 9 / 2	difference of internal weight too high	repeat calibration
ERROR 9 / 3	calibration factor bad	repeat calibration
ERROR 9 / 4		wait
ERROR 15 / 1	Supply to low	use right power supply
ERROR 15 / 2	Supply to high	use right power supply
ERROR 29	no Delta-temperature-compensation-referenc	repeat calibration
ERROR 30	no internal reference weight	acknowledge with TARE-key
ERROR 31	no external reference weight	acknowledge with TARE-key
ERROR 41	name already used	use an other name
ERROR 42	name invalid	use an other name
ERROR 47	too many values	use fewer values
ERROR 48	different first unit from input	use the original unit
ERROR 49	too few values	use more values
ERROR 53	values out of range +/- 50%	use appropriate weight
ERROR 60	fallen below minimum transformer area	call service
ERROR 61	maximum transformer area exceeded	call service
ERROR 80	too few values	add sample
ERROR 81	too many sample	cance sample
ERROR 90	no disc free	cancel disc
ERROR 91	no disc saved	add disc
ERROR 92	no sample	add sample

3.2 Fatal error

(Balance stays still, error repair in service mode)

ERROR-No.	ERROR responsibility	ERROR repair
ERROR 10	no linearisation values	repeat linearisation
ERROR 11	no calibration factor	repeat calibration
ERROR 12	keine SCS Einschalt-Drift Werte	call service
ERROR 21	no SCS temperature compensation values	call service
ERROR 22	no temperature compensation values	call service
ERROR 23	no SCS temperatur no-linearity compensation values	call service

3.3 Hardware error

(Balance stays still)

ERROR-No.	ERROR responsibility	ERROR repair
ERROR 14	wrong model code	call service
ERROR 16	internal RAM destroyed	replace CPU
ERROR 17	external RAM destroyed	replace RAM
ERROR 18 / 1	wrong program check sum	load right program, replace FLASH
ERROR 18 / 2	no approved program build in approved balance	load right program
ERROR 18 / 8	FLASH empty	load right program, replace FLASH
ERROR 18 / 9	wrong controller check sum	replace CPU
ERROR 19	wrong code figure	load right code figure
ERROR 20 / 1	temperature measurement Zelle defective	call service
ERROR 20 / 2	temperature measurement magnet defective	call service
ERROR 20 / 4	ADC-reference-sensor defective	call service
ERROR 28	no temperature values in °C	call service

4. Discussion with the manufacturer

In discussions with the manufacturer's works the following information should be provided:

- **Balance type** e.g. XR 405A
- **Order number** e.g. 320-9802-005 (Label on the underside of the balance)
- **Sales number** e.g. No. T20753 (Label on the underside of the balance)
- **Series number** e.g. 2602-16 (Label on the rear of the balance)
- **Program number** e.g. 00,00,A40 V00 (appears on the display when switching on the balance)
- **As precise a description of the defect as possible**
- **Weighing results**
- **Preparation of the samples**

PRECISA Gravimetrics AG
Moosmattstrasse 32
Po-Box 352
CH-8953 Dietikon
Tel. +41 44 744 28 28
Fax. +41 44 744 28 38
e-mail: service@precisa.ch
Internet: http://www.precisa.com

Subject to technical modification